



Samurai Engine Swap Wire Harness Instructions

1992–1995 Suzuki 1.6L, 16-Valve

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Revisions:

#	Date	Description
1	4/10	3-speed Automatic Transmission Wiring and Instructions
2	<i>pending</i>	Air Conditioning Wiring and Instructions

This information is intended to assist the Do-It-Yourself builder. The builder assumes all risk for use. All information is extracted from Factory Service Manuals. However, the relevancy of these instructions for any given application is not guaranteed. No warranty is provided on parts & materials (if included).

INTRODUCTION:

Much has been written about swapping Suzuki's G16B 1.6 liter 16-valve engine into the Samurai. It is mechanically very simple (as engine swaps go) but the wiring can be a daunting challenge for many. To date it has been necessary for the DIY builder to perform extensive research, gather all the information they can find, try to make sense of it, and take their best shot (or pay someone that has already done it).

There is no one "correct" way to make this engine swap. The variations are nearly endless. Much of it involves personal preference. What is presented here is a process that is known to be successful, along with some of the more familiar options.

This article is not intended to be "the" definitive work on the subject matter but rather as a starting point for the compilation of collective knowledge. I have tried to present this as a basic technical manual. It should be factual and unbiased. If you disagree with any of the content or presentation I will be more than willing to hear you out. This is a "living" document. It will be updated (probably annually) with relevant contributions (and corrections) from the Suzuki enthusiast community.

Please e-mail all communication pertaining to this manual to: zuki.joe@hotmail.com

Abbreviations:

A/T	Automatic Transmission	IAC	Idle Air Control valve
4A/T	4-Speed Automatic Transmission	IAT	Intake Air Temperature sensor
5GS	Fifth Gear Switch	IMS	Idle Micro Switch
CEL	Check Engine Light	IUS	Idle Up Solenoid
CMP.....	Cam Position Switch	M/T	Manual Transmission
CPP	Clutch Position Switch	MAF	Mass Air Flow Sensor
DCC	Duty Check Coupler	MAP	Manifold Absolute Pressure sensor
DLC	Data Link Connector	MCS	Mixture Control Solenoid
ECM	Engine Control Module	MR	Main Relay
ECT	Engine Coolant Temperature	NS	Ignition Noise Suppressor/Filter
EGR	Exhaust Gas Recirculation	P/S	Power Steering
EGRS	EGR Solenoid	PNP	Park Neutral Position Switch (A/T only)
EGRSV	EGR Solenoid Vacuum Valve	O2S	Oxygen Sensor
EGRT	EGR Temperature	SLS	Stop Lamp Switch
ETS	Engine Temperature Sensor (for gauge)	SLR	Shift Interlock Relay (A/T only)
EVAP	Evaporative Emissions System	TCCR	Torque Converter Clutch Relay (A/T only)
EVAPSP	EVAP Solenoid Purge Valve	TERS	Thermal Engine Room Switch
FCS	Fuel Cut Solenoid	TS	Thermal Switch
FPR	Fuel Pump Relay	TPS	Throttle Position Sensor
FPS	Fluid Pressure Switch	VS	Vent Solenoid
FSM.....	Factory Service Manual	VSS	Variable Speed Sensor
HAC	High Altitude Compensator	VSV	Vacuum Switching Valve
HO2S	Heated Oxygen Sensor	WOT	Wide Open Throttle Switch

Read the instructions all the way through before beginning!

Failure to do so may cause irreversible damage to the harness or engine components.

Part 1: GENERAL INSTALLATION NOTES

!!! SAFETY WARNING !!!

ALL WIRING SHOULD BE DONE WITH THE BATTERY REMOVED FROM THE VEHICLE

1.1. It is HIGHLY RECOMMENDED that you purchase the appropriate Field Service Manual for your engine model year (either digital or print copy). Though there are only two sections that are relevant to a transplanted engine the information is absolutely invaluable. Much – but not all – of the required Information is also available in most aftermarket vehicle specific service manuals (Haynes, Chilton's, etc.) The pertinent sections (6 & 8) of the 1996 Tracker FSM may be downloaded for free from Acksfaq.com (donations are appreciated).

1.2. 1992 through 1998 Suzuki/Geo (GM) vehicles with G16B (1.6 liter 16-valve) engines can be identified by the 8th digit in the Vehicle Identification Number. "O" for Suzuki badged vehicles, "6" for Geo's ("U" indicates an 8-valve 1.6L).

1.3. The most common set-up, and arguably the simplest, mates a donor Tracker or Sidekick engine, with the Samurai 5-spnd Manual Transmission. Donor engines with Automatic Transmissions (3 or 4 A/T) are easily rewired to work with the Samurai 5-spnd M/T. Specific notations for installing the donor engine with a 3 A/T appear where necessary. The 4 A/T is significantly more complicated and is not included in these instructions.

1.4. It is preferred (but not required) that the ECM and engine be of the same model year. However, as long as the computer has all the necessary inputs and outputs it makes no difference what motor it is physically controlling. It should be noted that OBD1 vehicles (1995 & earlier) are much less complex than OBD2 vehicles (1996 & after). The earlier technology is far easier for the amateur auto electrician to manage. OBD2, being more modern, has nearly twice as many sensors & controls. Properly tuned, OBD2 engines will provide slightly more power, better fuel economy, and cleaner emissions. Replacement parts are also easier to find, but of course, are more expensive.

1.5. Japanese Domestic Manufacture (JDM) 16v engines are available in the US but differ slightly in appearance and component locations. A North American market computer & wiring will operate a JDM engine but the adaptation requires a bit more forethought and planning.

1.6. The factory uses machine crimped splices. Hand crimping is not always as reliable but is much easier to do. Soldering gives you a physically stronger connection but may change the resistance of the splice. Both methods will produce acceptable results if done properly. A bad splice might, or might not, throw off sensor input to the computer. Either way wire splicing should be kept to an absolute minimum. What splices there are should be staggered along the course of the harness to reduce the potential for shorts if they do come apart.

1.7. In some cases it is easier to leave one or more wires attached to certain connectors. These assemblies are referred to as "pigtails". The wire(s) may be attached to a component, have terminals or be cut on one end. But, generally there will only be one plug.

1.8. In these instructions multiple wires that are spliced together in various "Y" configurations are referred to as "segments". The wires may be cut or have terminals on the ends but usually won't have any plugs attached.

1.9. Clear plastic zipper bags are probably the best way to organize this project. Individual wires usually fit in "snack" size bags, wire segments and pigtails in quart size bags. The bagged wire for the entire project fits in a copy paper box. The unused wire can be stored in an additional box (roughly the same size).

1.10. Don't cut any more wire than you have too. Leave all "pigtails" and wire leads as long as physically possible. Double back any excess wire on itself, and incorporate it into the harness (you may want or *need* it later!).

1.11. It is possible to swap both the 16v A/C and P/S systems into a Samurai together. It requires special brackets and/or repositioning the entire motor. Most builders opt for just the P/S. Wiring instructions for Air Conditioning are not included at this time.

1.12. The instructions will make considerably more sense if you take time to thoroughly review and understand the wiring diagrams (see Part 8.).

Part 2: TERMINALS & CONNECTORS

2.1. It is essential to the success of the project that you master releasing & reinserting connector terminals. The wires (with terminal attached) can be routed places the connector bodies will not fit (in particular the firewall grommets). Cavities are numbered left to right & top to bottom as viewed at the female connector face. The locking tab identifies the top. For wire-to-wire connections the male connector cavity numbers are a mirror image of their female counterpart. The “sex” of a connector is determined by the pins and sockets not the shape of the housing.

2.2. Most of the connectors you’ll be working with are the Push-to-Seat type. To remove; release the locking tab (from the front of the housing) and the terminal comes out the back. To install; push the terminal into the cavity from the back until the locking tab seats (there is often a faint but audible click). Pay particular attention when disassembling the connectors to the orientation of the terminals in each plug. If they are reinstalled upside down they can get stuck in the cavity and will not mate properly. There are special tools designed for this purpose but a small jeweler’s flat blade screw driver (and a little patience) works just as well. (see Fig. “A”)

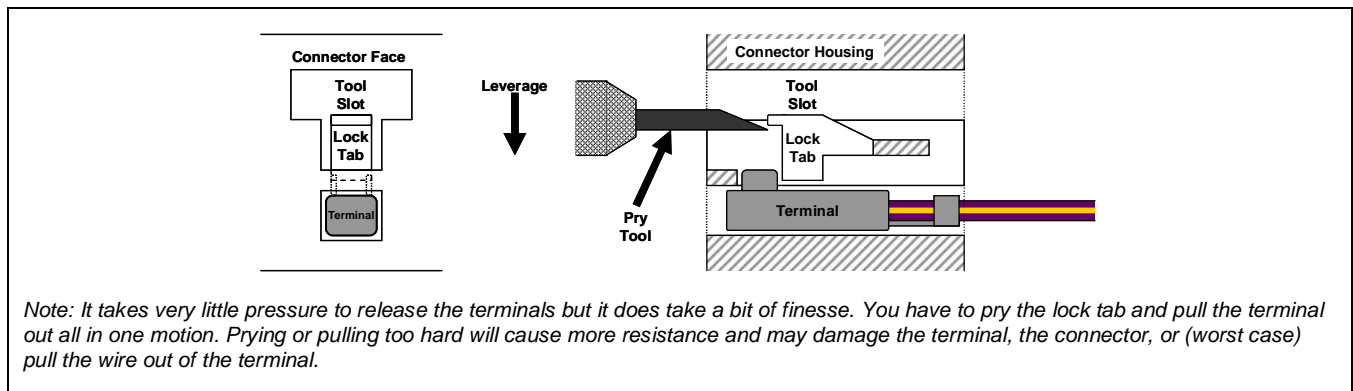
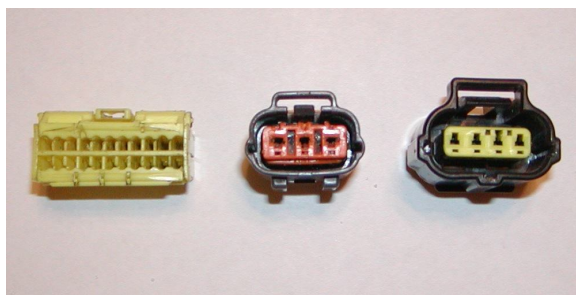
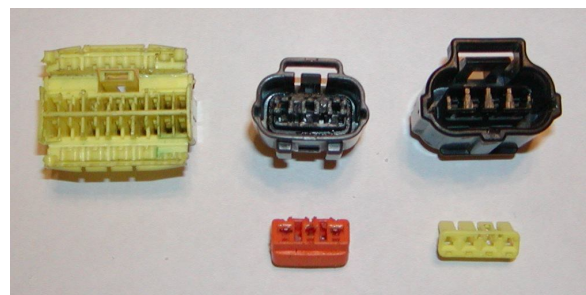


Figure A.

2.3. Some plugs have a Terminal Positioning System (TPS). The TPS can be integrated into the connector housing, like the ECM plugs which are hinged to the back of the housing, or it can be a physically separate part. Some are internal, some are external. Generally these are different color than the connector body. The TPS (if present) must be removed to access the terminal lock tabs.



TPS Closed/Installed



TPS Open/Removed

Note: Photo of external TPS connector not available at time of publication.

2.4. For Suzuki vehicles The 100 series of connectors, splices and grounds are located under the hood. The 200 series is under the dash. The 300 series is in the passenger compartment and the 400 series is in the rear of the vehicle. Project splices are marked on the diagrams with red diamonds and are numbered similarly. The “1 alpha” series is located under the hood, and the “2 alpha” series is under the dash (based on where they end up, not where the splicing physically takes place).

Part 3: DONOR HARNESS REMOVAL (preferably from engine donor vehicle)

3.1. Disconnect Engine Wire Harness (under driver's side dash). Pry out the driver's-side firewall grommet and cut it off the harness (take care not to damage the wires). Extract under-dash portion of engine harness (with connectors), via engine bay side. Remove engine with harness attached. Then remove the wiring from the engine. If engine teardown is not planned, the Fuel Injector harness (across the top of the intake manifold) may be left installed. No modification to it is required.

3.2. It is not necessary to totally remove all the wiring from the engine bay. However, disconnecting components, releasing tie-downs clamps, etc. and removing the majority of the tape & wire loom in advance, will save time in the long run.

3.3. Disconnect headlights, turn signals, marker lights, grounds, and all remaining components on both fender wells and the firewall. Pull retaining clip off the front of the Igniter connector & remove the plug. Unplug the Coil. Dismount the bracket from the firewall (leave the components attached). Unplug and remove the Noise Suppressor (usually taped to the harness below the wiper motor) Bag the ignition components together (including the Igniter plug clip) and set them aside for later.

3.4. Remove donor vehicle instrument cluster and dashboard (use caution with air bag system). It is not absolutely necessary to remove the dash but its well worth the time and aggravation it saves. Set the instrument cluster aside so the VSS can be extracted later.

3.5. Remove the Data Link bracket & connector(s) from under the driver's side dash. Disconnect the pigtail (at C206). Bag it and set it aside. *Note: some vehicles will have two plugs on this bracket. The second is a Data Link for the Rear Wheel Anti-Lock Braking system. Removing this pigtail is optional.*

3.6. Unplug the ECM & Fuel Pump Relay (under driver's-side dash). Remove the mount bracket (with ECM and relays attached). Separate the computer and relays from the bracket and set them all aside.

3.7. A/T Installations (Only):

3.7.1. The wire harness on the transmission itself should remain essentially undisturbed.

3.7.2. If not already done, disconnect the Manual Selector Lever harness at C207. Then remove the whole lever assembly. *(Note: This assembly includes the Shift lock Solenoid)*

3.7.3. There are also some key components and wiring under the donor dash that must also be removed for an A/T swap. These items are located above and behind the brake pedal. Wire details are listed at the end of each relevant table. Unplug, and dismount the following items (bag for later use):

- a. Stop Lamp Switch (GRN, BLK/WHT, GRN/WHT, WHT/RED wires)
- b. Shift Diode (YEL/BLU & BLU/BLK wires)
- c. Shift Lock Relay (wires are GRN/WHT, BLU/BLK, BLU/RED, BLU/GRN).

3.8. Disengage the ECM/under-dash harness. Start at the ECM connectors and follow the wiring from there. Remove clamps, brackets, ties, tape, etc., as necessary, disconnecting plugs as you go. *Note: Many of the wires lead through the firewall to components in the engine bay. DO NOT CUT ANY WIRES!!!* Extract connector terminals as necessary to free wire ends allowing them to be disentangled.

3.9. Pry the remaining firewall grommet(s) out the engine bay side and cut them off of the harness. Take care not to damage the wires. Then extract the entire ECM harness from inside the vehicle (carefully feeding the engine bay wires and connectors through the firewall openings).

3.10. POWER DISTRIBUTION UPGRADE “PARTS”: Though not technically part of the engine swap, this is definitely the ideal time to modernize the Samurai’s primary power distribution system. To do so, remove the following parts from the donor vehicle:

3.10.1. Dismount the Fusible Link Block (Fig. 8A-201-2 #5). Remove the cover and disconnect the alternator & battery leads. Unplug the two connectors on the bottom (C1- WHT wire & C2 - WHT/YEL & WHT/GRN wires). Reinstall the cover and set the fuse block aside.

3.10.2. Disconnect the relays and remove the Duty Check connector from its mount tab Fig. 8A-201-2 #6). Remove the bracket from the fender and force the relays off the tabs. Save TCC Relay for A/T install (Fig. 8A-201-2 #3). Save the A/C relays for spare parts and put the bracket with the fuse link block.

3.10.3. Dismount the Fuse Block (under diver’s side dash). Cut the 8ga WHT/YEL & WHT/GRN, the 10ga WHT and 14ga BLK/RED wires approximately 3” to 4” from their respective fuse terminals. Follow the RED/BLK wire to the Main Relay. Unplug connector and extract the wire terminal. Bag the wire.

3.10.4. Disconnect the Ignition Switch pigtail. Extract the terminal (on the other leg of the WHT/GRN wire) from the connector.

3.10.5. Pull the other three wire segments (WHT/YEL, WHT/GRN, & WHT) through the firewall from the engine bay side. Unwrap donor harness (if not already done) as needed and separate the wire segments from the firewall harness.

3.10.6. After separating the C1 & C2 pigtails, remove the lead with the cut end from the WHT/GRN segment at the splice (S276). Expose the splice, cut off the extra wire, and re-insulate the splice. Bag the Fusible Link C1 (1-wire) and C2 (2-wire) pigtails separately.

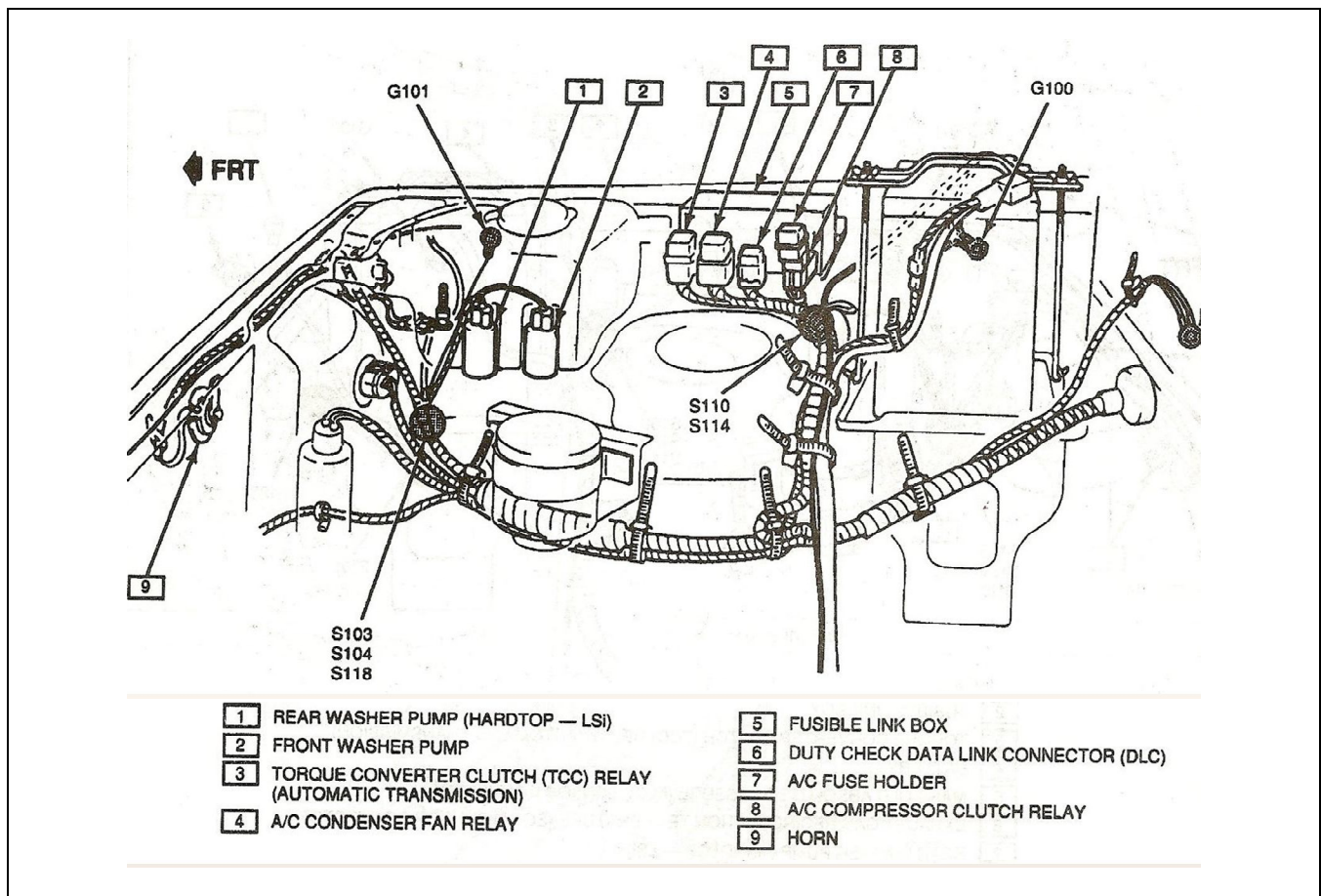


Figure: 8A-201-2

Part 4: DONOR HARNESS PREPARATION

4.1. 50 to 70 percent of the donor harness is not required for the engine swap. The least confusing way (but unfortunately most time consuming) to separate the wiring you need from the donor harness is deconstruct it wire by wire then reassemble the parts you need. The term “discard” is used for items that are not required for the project. However, it is recommended that you box up the unused wires and parts and save them (for parts).

4.2. Cut wires ONLY when and WHERE instructed to do so!

4.3. Some wire colors may vary, particularly the grounds, which may be any combination of BLK, BLK/GRN, BLK/BLU or BLK/ORN (or all BLK). The shades of a color vary also. (i.e. PPL ranges from a light lavender to a dark royal purple). Age and fading only add to the problem. The lighter colors (white yellow, light green & orange) can appear gray. The darker colors (blue, green & red) tend toward black. Oil, grease & dirt can make color identification difficult if not virtually impossible sometimes. Clean things up as best you can but don't get hung up on the colors. If they can't be identified tag the wires with the color they are *supposed* to be & move on. As long as all the components are connected correctly the actual wire color is irrelevant.

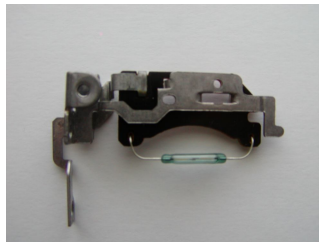
4.4. The O2 sensor signal wire is always shielded and supplied with a drain wire (to ground). It may be shielded individually or paired with a ground. The outer shell can be gray, brown or blue. This color doesn't matter and is not referenced in the wire diagrams. The inner sensor wires also vary between WHT, RED/BLU or YEL/BLU. If paired with a colored wire, the ground wire is usually GRA/YEL. If a ground wire is paired with WHT it is usually BLK.

4.5. The Cam Position Sensor is located inside the Distributor. The FSM shows the CMP signal carried on a shielded wire. Like the O2 sensor there *should* be a braided drain wire to contend with. However, this is not always the case. If the wire is not shielded, no special handling is required.

4.6. VARIABLE SPEED SWITCH EXTRACTION:

4.6.1. Disassemble the donor Combo Meter (instrument cluster) and remove the speedometer. The VSS assembly fits across the top of the speedometer frame. The reed switch itself sits behind the rotating disk. There are two types but they both fit in the same relative position.

- a. The metal frame assembly is secured in place by two screws on one side and a tang on the other. Removing the screws allows the assembly to rotate up and out of the speedometer frame.



- b. The plastic frame type is secured by a screw on either side. Removing the screws allows the assembly to lift straight up and out of the speedometer frame.



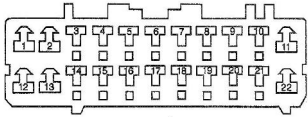
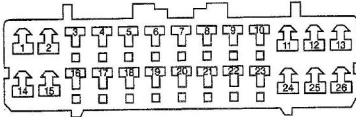
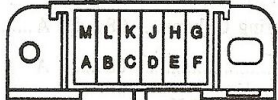
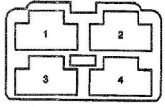
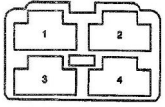
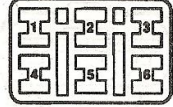
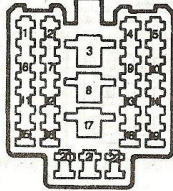
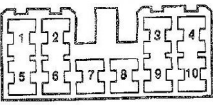
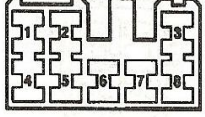
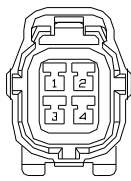
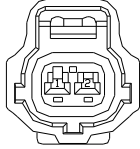
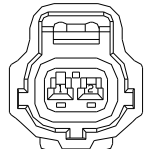
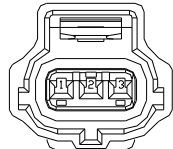
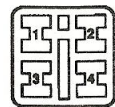
4.7. ECM /FIREWALL HARNESS DECONSTRUCTION:

4.7.1. Starting with the smaller ECM connector (C1), extract the wire terminals and separate the wires one at a time, unwrapping the harness as needed. When you reach a connector record the terminal position and extract the terminal. If the wire branches off, follow each branch to a connector and pull the terminal. After separating each wire, segment, and/or pigtail, coil the wire loosely and place it in a small zipper bag. Bag all wires by color. ID and tag the connectors as they are released from the harness. The "loose" plugs can all be bagged together. Apply the same process to the Larger ECM Connector (C2) and work your way through the Wire-by-Wire Deconstruction Tables on the following pages from there.

4.7.2. Wire diagram references in the deconstruction tables are from the 1995 Geo Tracker Service Manual (GMT/95-JE). They are provided to assist builders who have access to an FSM. Prior model year manuals should have similarly numbered diagrams (wire colors may differ slightly).

4.7.3. To assist with identification, images of the relevant connector faces are provided below.

16v ECM HARNESS CONNECTOR FACES

<p><u>ECM C1</u></p>  <p>yellow</p>	<p><u>ECM C2</u></p>  <p>yellow</p>	<p><u>Data Link Connector (DLC)</u></p>  <p>Black</p>
<p><u>Main (MR) & Fuel Pump (FPR) Relays</u></p>  <p>Color varies</p>	<p><u>Torque Converter Clutch (TCC) & Shift Lock (SLR) Relays</u> (A/T only)</p>  <p>Color varies</p>	<p><u>Duty Check Data Link Connector (DCC)</u></p>  <p>Natural</p>
<p><u>C204</u></p> <p>MALE PLUG – PIN POSITIONS REVERSED</p>  <p>White (or natural)</p>	<p><u>C206</u></p> <p>MALE PLUG – PIN POSITIONS REVERSED</p>  <p>Natural</p>	<p><u>C209</u></p> <p>MALE PLUG – PIN POSITIONS REVERSED</p>  <p>Natural</p> <p><i>Note: the 4A/T has a plug that more closely resembles C204</i></p>
<p><u>Noise Suppressor/Filter (NS)</u></p>  <p>Black (yellow TPS)</p>	<p><u>Igniter</u></p> <p>Rectangular 1x3 Connector</p> <p>No Image Available</p> <p>Gray (external red TPS)</p>	<p><u>Ignition Coil</u></p>  <p>Black (yellow TPS)</p>
<p><u>Inlet Air Temp Sensor (IAT)</u></p>  <p>Black (yellow TPS)</p>	<p><u>Mass Air Flow Sensor (MAF)</u></p>  <p>Gray (orange TPS)</p>	<p><u>Heated Oxygen Sensor (HO2S)</u></p>  <p>Natural</p>
















WIRE-BY-WIRE DETAILS - 16v ECM Harness Deconstruction

Wire Color	Circuit	FSM Diagram	Connection	Notes
ECM C1				
WHT	Memory Power	8A-21-0	C1-1	Extract socket.
			S212	Cut wire at first splice. Separate and bag wire.
BLK/YEL	Crank Signal	8A-21-7	C1-2	Extract socket.
			C205-8	With A/C - extract terminal.
			S223 / S242	Without A/C - cut C205 lead off segment at first splice.
			C204-3	Extract pin.
			C208-2	Cut wire "3" from CPP plug. Separate and bag segment.
	A/T Donor		C204-3	Extract pin. Separate and bag segment.
PPL	Duty Check Output	8A-21-1	C1-3	Extract socket.
			DCC-6	Extract socket. Separate & bag wire.
ORG	Igniter Driver Output	8A-21-7	C1-4	Extract socket.
			IG-3	Gently pry the red terminal lock off the back of the connector housing. Separate wire.
PNK	Fuel Pump Relay Control	8A-21-4	C1-5	Extract socket.
			FPR-3	Extract socket. Separate and bag wire.
BLU/RED	Test Switch Signal	8A-21-1	C1-6	Extract socket.
			DCC-5	Extract socket. Separate and bag wire.
YEL	VSS Signal	8A-33-0	C1-7	Extract socket.
			C200-22	Cut wire "3" from first plug. Separate and bag wire.
BRN	Ignition Signal (Tachometer)	8A-21-7	C1-8	Extract socket.
			NS-3	Extract socket.
			C201-8	Follow to remaining connector. Extract and cut terminal off wire. Separate and bag wire segment.
YEL/BLK	A/C Idle Up Signal	8A-64-1	C1-9	Extract socket.
			C205-9	Extract terminal. Separate and bag wire.
BLU	Main Relay Control	8A-21-1	C1-10	Extract socket.
			MR-3	Extract socket. Separate & bag wire.
	Not Used		C1-11	none
BLU/BLK	Ignition Power	8A-21-1	C1-12	Extract terminals. Separate & bag wire segment.
BLU/BLK			C1-13	
			MR-4	
			FPR-2	
			MAF-1	
			C204-17	
	A/T Donor (M/T install)		S295	Cut TCCR lead off segment at last splice before C204.
	A/T Donor (A/T install)		TCCR-1	Extract socket. Separate & bag entire wire segment.
PPL/YEL	CEL/MIL Control	8A-21-1	C1-14	Extract socket.
			DCC-3	Extract socket.
			C200-2	Cut wire "3" from plug. Separate and bag "Y" segment.














WIRE-BY-WIRE DETAILS - 16v ECM Harness Deconstruction

Wire Color	Circuit	FSM Diagram	Connection	Notes
LT GRN/WHT	EGR SV Control	8A-21-3	C1-15	Extract socket.
			C204-5	Extract pin. Separate & bag wire.
WHT/YEL	TCC Relay Control (A/T only)	8A-21-3	C1-16	Extract socket.
			TCCR-3	Extract socket. Separate wire. Bag for A/T install, otherwise discard.
BLU/YEL	Diagnostic Request Signal	8A-21-1	C1-17	Extract socket.
			DCC-2	Extract socket.
			C206-2	Extract pin. Separate segment. Cut C206 lead off of segment at splice (S279) and discard. Bag remaining wire.
BLU/WHT	Idle Switch Signal	8A-21-5	C1-18	Extract socket.
			C204-18	Extract pin. Separate and bag wire.
BLU/ORG	Power Steering Press Signal	8A-21-5	C1-19	Extract socket. Separate and bag wire.
	Not Used		C1-20	none
	Not Used		C1-21	none
BLK/RED	Park/Neutral Signal (A/T Only)	8A-21-7	C1-22	Extract socket.
			C204-8	Extract pin.
			IGS-6	Cut wire 3" from Ignition Switch pigtail. Separate wire segment. Bag for A/T install, otherwise discard.
ECM C2				
BLK/BLU	ECM Ground	8A-14-2	C2-1	Extract socket.
			IG-2	Extract socket.
			G110	Cut "12" from ring terminal. Separate and bag segment.
BLK	ECM Ground	8A-14-2	C2-2	Extract socket.
			C209-7	Extract pin.
			MAF-3	Extract socket (may be grounded separately).
			G110	Cut "12" from ring terminal.
WHT	CMP Sensor Signal	8A-21-7	C2-3	Extract socket.
			C209-5	Extract pin.
BLK	CMP Braided Drain (ground)	8A-21-7	C209-4	Extract pin.
YEL/BLU	Exhaust O2 Concentration	8A-21-3	C2-20	Extract socket.
RED/BLU			HO2S-2	Extract socket.
WHT				
Note:	The CMP & HO2S signals are normally carried by shielded wires. A braided drain wire is spliced to the C2-2 ground segment very close to the ECM connector (S218). Separate the shielded wires and ground segment from the harness but leave the splices intact. Bag signal wires and attached ground segment together.			
	Not Used		C2-4	none
	Not Used		C2-5	none
GRY/RED	Throttle Position Signal	8A-21-8	C2-6	Extract socket.
			C204-14	Extract pin. Separate and bag wire.
GRY	Reference Voltage (5V)	8A-21-8	C2-7	Extract socket.
			C204-13	Extract pin. Separate and bag wire.





WIRE-BY-WIRE DETAILS - 16v ECM Harness Deconstruction

Wire Color	Circuit	FSM Diagram	Connection	Notes
GRY/BLK 	MAF Signal	8A-21-8	C2-8	Extract socket.
			MAF-2	Separate wire (bag pigtail if ground wire terminal has already been extracted).
BLK/BLU 	MAF (independent ground)		MAF-3	Leave socket in place.
			G110	Cut wire "12" from ring terminal. Separate wires, bag pigtail.
RED/YEL 	ECT Signal	8A-21-8	C2-9	Extract socket.
			C204-15	Extract pin. Separate and bag wire.
	Not Used		C2-10	none
RED 	Fuel Injector #1 Control	8A-21-5	C2-11	Extract socket.
			C204-21	Extract pin. Separate and bag wire.
LT GRN/BLK 	IAC Valve Control	8A-21-5	C2-12	Extract socket.
			C204-20	Extract pin. Separate and bag wire.
WHT/GRN 	Fuel Injector #3 Control	8A-21-5	C2-13	Extract socket.
			C209-2	Extract pin. Separate and bag wire.
BLK/GRN 	ECM Ground	8A-14-2	C2-14	Extract socket.
			G110	Cut "12" from ring terminal. Separate and bag wire.
GRY/YEL 	Sensor Ground	8A-21-8	C2-15	Extract terminals. Separate and bag wire segment.
			C204-19	
			AIT-2	
			HO2S-1	
PPL/GRN 	Serial Data Output	8A-21-1	C2-16	Extract socket.
			C206-6	Extract pin. Separate and bag wire.
RED/GRN 	EGR Temperature Input	8A-21-3	C2-17	94 & 95 CA spec. + some 95 Fed spec. If wire is present, extract terminals, separate & bag.
			C209-1	
	Not Used		C2-18	none
	Not Used		C2-19	none
RED/BLK 	Inlet Air Temperature Signal	8A-21-8	C2-21	Extract socket.
			IAT-1	Separate wire and bag pigtail.
	Not Used		C2-22	none
PNK 	HO2S Heater Control	8A-21-3	C2-23	Extract socket.
			HO2S-3	Extract socket. Separate and bag wire.
LT GRN/RED 	Fuel Injector #2 Control	8A-21-5	C2-24	Extract socket.
			C204-22	Extract pin. Separate and bag wire.
LT GRN/YEL 	EVAP SP Valve Control	8A-21-3	C2-25	Extract socket.
			C204-10	Extract pin. Separate and bag wire.
WHT/BLK 	Fuel Injector #4 Control	8A-21-5	C2-26	Extract socket.
			C209-3	Extract pin. Separate and bag wire.



























WIRE-BY-WIRE DETAILS - 16v ECM Harness Deconstruction

Wire Color		Circuit	FSM Diagram	Connection	Notes
C204 ♂ (remaining wires)					
ORG/BLK		4WD Switch (A/T only)	8A-44-1	C204-1	(M/T install) Extract pin and abandon wire.
				S275	(A/T install) Extract pin, cut wire at splice, and bag.
BLK/WHT		Generator Volt Regulator Input	8A-30-1	C204-2	Extract pin.
YEL/BLK		Oil Pressure Switch	8A-81-1	C204-4	Extract pins and abandon wires.
ORG/WHT		Not Used		C204-6	
WHT/RED		Charge Indicator Light Power	8A-30-1	C204-7	
YEL/WHT		Engine Temp Gauge Signal	8A-81-1	C204-9	Extract pin.
				C200-7	Cut "3" from plug. Separate and bag wire.
BLK		Grounds G200/G201/G202	8A-14-3	C204-11	Extract pin and abandon wire.
YEL		Backup Lamp (M/T)	8A-112-0	C204-12	(M/T install) Extract pin and abandon wire.
		PNP - Backup Lamp (A/T)	8A-112-0		(A/T install) Extract pin.
				S208	(A/T install) Cut at first splice and bag wire.
BRN/RED		Backup Lamp (M/T)	8A-112-0	C204-16	(M/T install) Extract pin, abandon wire bag C204 plug.
		PNP - Backup Lamp (A/T)	8A-112-0		(A/T install) Extract pin. Bag C204 plug.
				C203-2	(A/T install) Extract pin. Bag wire.
C206 ♂ (remaining wires)					
		Not Used		C206-1	none
PPL/RED		RWAL Switch Signal	8A-44-0	C206-3	Extract pin and abandon wire.
		Not Used		C206-4	none
BLK		Ground	8A-44-0	S214	Cut at first splice and separate wire.
				C206-5	Leave pin in place.
WHT		RWAL Brake Speed Sensor	8A-44-0	C206-7	Extract pin and abandon wire.
ORG		RWAL Brake Speed Sensor	8A-44-0	C206-8	Extract pin and abandon wire.
WHT		Diagnostic Tool Power	8A-44-0	S212	Cut at first splice and separate wire
				C206-9	Bag BLK & WHT wires and C206 plug as pigtail.
		Not Used		C206-10	none
C209 ♂ (remaining wires)					
BLU/RED		PNP Signal (A/T Only)	8A-138-0	C209-6	(M/T install) Extract pin and abandon wire.
				SLR-3	(A/T install) Extract terminals. Separate and bag "Y" segment.
				C201-4	
WHT		Fluid Press. Switch (A/T Only)	8A-21-3	C209-8	(M/T install) Extract pin abandon wire. Bag C209 plug.
				TCCR-4	(A/T install) Extract socket. Bag wire.

WIRE-BY-WIRE DETAILS - 16v ECM Harness Deconstruction

Wire Color	Circuit	FSM Diagram	Connection	Notes
Misc. (remaining wires)				
BRN/WHT 	Coil Signal	8A-21-7	IG-1	Extract socket. Bag ORG wire pigtail.
			Coil 2	Extract socket. Bag connector.
			NS-4	Bag "Y" segment.
BLK 	Ignition Ground	8A-21-7	NS-1	Bag "Y" Segment and NS plug as a pigtail.
			G108	
			G109	
PNK/ BLK 	Fuel Pump Power	8A-21-4	C203-1	Follow wire to first connector. Cut wire "3" from plug.
			FP-4	Separate wire and bag relay pigtail.
BLK/WHT 	Igniter, Coil & Meter power (B+)	8A-11-7	C201-9	Extract connector terminals.
			MR-1	
			FPR-1	
			HO2S-4	
			Coil 1	
			NS-2	
			Fuse Block	Cut the entire segment out of the harness 3" from fuse block terminal.
	A/T Donor (M/T install)		S227	Cut Stop Lamp switch lead off at first splice.
	A/T Donor (A/T Install)		SLS-2	Extract socket from Stop Lamp Switch connector.
			S131	Cut lead to C201 connector at 2 nd splice (if present).
			S132	Cut lead to C204 connector at 3 rd splice (where HO2S, Coil & NS leads join the segment). Bag remaining segment.

WIRE-BY-WIRE DETAILS - 16v Harness Deconstruction for 3 A/T

Wire Color		Circuit	FSM Diagram	Connection	Notes
C201 ♀					
GRN/RED		LH Turn Signal	8A-110-2	C201-1	Extract sockets and abandon wires.
GRN/YEL		RH Turn Signal	8A-110-2	C201-2	
RED/YEL		Light Switch (PARK)	8A-114-0	C201-3	
RED/BLK		Brake Warning Indicator	8A-41-1	C201-5	
WHT		Tail Dome B+	8A-114-0	C201-6	
PPL/RED		Ignition Switch (Bulb Test)	8A-41-0	C201-7	
BLU/GRN		Shift Interlock	8A-138-0	SLR-4	Extract socket.
				C201-10	Separate wire, bag 1-wire pigtail.
C201 ♂					
GRN/RED		LH Turn Signal	8A-110-2	C201-1	Extract pins and abandon wires.
GRN/YEL		RH Turn Signal	8A-110-2	C201-2	
RED/YEL		Light Switch (PARK)	8A-114-0	C201-3	
BLU/RED		Shift Interlock	8A-138-0	C201-4	Extract pin.
RED/BLK		Brake Warning Indicator	8A-41-1	C201-5	Extract pins and abandon wires.
WHT		Tail Dome B+	8A-114-0	C201-6	
PPL/RED		Ignition Switch (Bulb Test)	8A-41-0	C201-7	
BRN		Tachometer	8A-81-0	C201-8	
BLK/WHT		Igniter, Coil, Meter B+	8A-11-7	C201-9	
BLU/GRN		Shift Interlock	8A-138-0	C201-10	Extract pin. Bag connector with others.
C207 ♀					
RED/YEL		Interior Lighting	8A-114-1	C207-1	Cut wire at first splice (S291).
RED/GRN		Interior Lighting	8A-114-1	C207-2	Cut wire at first splice (S268).
BLU/GRN		Shift Interlock	8A-138-0	C207-3	Separate and bag 4-wire C207 pigtail.
BLU/RED		Shift Interlock	8A-138-0	C201-4	
SLS ♀ (Stop Lamp Switch)					
WHT/RED		TCC Relay signal	8A-21-2	SLS-4	Extract socket.
				TCCR-2	Separate and bag pigtail.
GRN		Stop Lamp Power (B+)	8A-110-4	SLS-1	Extract socket and abandon wire.
GRN/WHT		Stop Lamp Signal	8A-110-4	SLS-3	Extract socket. Bag loose SLS connector.
				S260	Cut EBCM lead off at splice.
				C203-5	Cut wire 3" from connector.
				SLR-1	Extract socket. Separate and bag "Y" segment.
SD ♀ (Shift Diode)					
YEL/BLU		Shift Lock Relay Power (B+)	8A-138-0	SD-1	Cut wire at first splice (S206).
BLU/BLK		Shift Lock Relay Power (B+)	8A-138-0	SLR-2	Extract socket. Bag loose SLR plug.
				SD-2	Bag 2-wire diode pigtail.

4.8. ENGINE HARNESS DECONSTRUCTION:

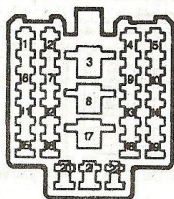
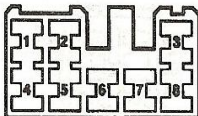
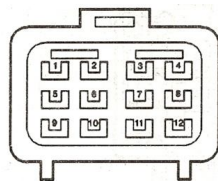
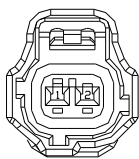
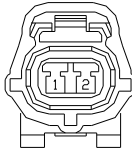
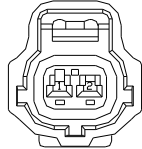

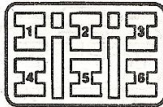



4.8.1. It is not actually necessary to disassemble the engine electrical harness. The only reason for doing so is to eliminate unused pigtails. It gives you a much neater looking installation. Leaving this harness “as is” will not affect engine operation in any way.

4.8.2. The instructions on the following pages provide information on “cleaning up” the engine harness. During this process the Oil Pressure signal and Generator control wires on the new harness are abandoned in favor of the Samurai wiring (which is “plug-n-play” for the new motor). The rest of the pigtails are A/T related.

4.8.3. Wire diagram references in the deconstruction tables are from the 1995 Geo Tracker Service Manual (GMT/95-JE). They are provided to assist builders who have access to an FSM. Prior model year manuals should have similarly numbered diagrams.

4.8.4. To assist with identification, images of the relevant connector faces are provided below.









ENGINE HARNESS CONNECTOR FACES

<p><u>C204</u></p>  <p>White (or natural)</p>	<p><u>C209</u></p>  <p>Natural</p> <p><i>Note: the 4A/T has a plug that more closely resembles C204</i></p>	<p><u>C103</u></p>  <p>White or Black (yellow TPS)</p>		
<p><u>Engine Coolant Temp Sensor (ECT)</u></p>  <p>Green</p>	<p><u>EGR Solenoid Purge Valve (EGR SP)</u></p>  <p>Blue</p>	<p><u>EVAP Solenoid Valve (EVAP SV)</u></p>  <p>Black (may have yellow TPS)</p>		
<p><u>Distributor</u></p>  <p>Gray (orange TPS)</p>	<p><u>C100 (A/T only)</u></p>  <p>Natural</p>	<p><u>PNP (A/T only)</u></p> <table><tr><td><p><u>C1</u></p><p>Round 1x2 Plug</p><p>No Image Available</p><p>Natural</p></td><td><p><u>C2</u></p><p>Natural</p></td></tr></table>	<p><u>C1</u></p> <p>Round 1x2 Plug</p> <p>No Image Available</p> <p>Natural</p>	<p><u>C2</u></p>  <p>Natural</p>
<p><u>C1</u></p> <p>Round 1x2 Plug</p> <p>No Image Available</p> <p>Natural</p>	<p><u>C2</u></p>  <p>Natural</p>			

WIRE-BY-WIRE DETAILS - 16v Engine Harness Deconstruction

Wire Color	Circuit	FSM Diagram	Connection	Notes
C204 ♀				
ORG/BLK	4WD Switch (A/T only)	8A-44-1	C204-1	(M/T install) Extract socket. Separate and discard wire.
				(A/T install) Leave terminal & wire in place.
BLK/WHT	Gen. Voltage Regulator Signal	8A-30-1	C204-2	Extract sockets. Separate wires and bag 2-wire pigtail with green plug attached. <i>Marketable item (not req'd for swap)</i>
WHT/RED	Charge Indicator Light Signal		C204-7	
BLK/YEL	Crank Signal	8A-21-6	C204-3	(M/T install) Extract socket.
			PNP C1-2	(A/T install) Leave terminal & wire in place.
			Starter	Separate "Y" and Bag segment.
BLK/RED	PNP Signal (A/T Only)	8A-21-6	C204-8	(M/T install) Extract socket. Separate and discard pigtail.
			PNP C1-1	(A/T install) Leave terminal & wire in place.
YEL/BLK	Oil Pressure Switch	8A-81-1	C204-4	(M/T install) Extract socket. Separate and discard.
BLK	Ground (A/T Only)		C204-11	(M/T install) Extract socket.
				(A/T install) Leave socket & wire segment in place.
			C100-5	(M/T install) Extract terminal.
			PNP C2-4	(M/T install) Extract socket. Discard segment.
YEL	Backup Lamp (M/T)	8A-112-0	C204-12	(M/T install) Extract socket and abandon wire.
				(A/T install) Leave socket & wire in place.
	PNP - Backup Lamp (A/T)	8A-112-0	PNP C2-3	(A/T install) Leave socket & wire in place.
BRN/RED	Backup Lamp (M/T)	8A-112-0	C204-16	(M/T install) Extract socket and abandon wire.
				(A/T install) Leave socket & wire in place.
	PNP - Backup Lamp (A/T)	8A-112-0	PNP C2-1	(A/T install) Leave socket & wire in place.
	Not Used		C204-6	none
LT GRN/WHT	EGR SV Control	8A-21-3	C204-5	Leave wires, terminals, and connectors in place.
YEL/WHT	Engine Temp Gauge Signal	8A-81-1	C204-9	
LT GRN/YEL	EVAP SP Signal	8A-21-3	C204-10	
GRY	Throttle Position Sensor	8A-21-8	C204-13	
GRY/RED	TPS Reference Voltage (5V)	8A-21-8	C204-14	
RED/YEL	ECT Signal	8A-21-8	C204-15	
BLU/BLK	IAC & Fuel Injector Power	8A-21-5	C204-17	
BLU/WHT	TPS (Idle Switch Signal)	8A-21-8	C204-18	
GRY/YEL	Sensor Ground	8A-21-8	C204-19	
LT GRN/BLK	Idle Air Control Valve Signal	8A-21-5	C204-20	
RED	Fuel Injector #1 Signal	8A-21-5	C204-21	
LT GRN/RED	Fuel Injector #2 Signal	8A-21-5	C204-22	

WIRE-BY-WIRE DETAILS - 16v Engine Harness Deconstruction

Wire Color		Circuit	FSM Diagram	Connection	Notes
C209 ♀					
RED/GRN		EGR Temp Signal	8A-21-3	C209-1	Leave wires, terminals, and connectors in place.
WHT/GRN		Fuel Injector #3 Signal	8A-21-5	C209-2	
WHT/BLK		Fuel Injector #4 Signal	8A-21-5	C209-3	
BLK		CMP Drain Wire	8A-21-7	C209-4	
WHT		CMP Signal	8A-21-7	C209-5	
BLU/RED		Shift Lock Signal	8A-138-0	C209-6	(M/T install) Extract socket. Abandon wire.
				PNP C2-2	(A/T install) Leave terminal and wire in place.
BLK		CMP Ground		C209-7	Leave terminals and wire in place.
WHT		Fluid Press. Switch (A/T Only)	8A-21-3	C209-8	(M/T install) Extract socket. Abandon wire.
				C100-2	(A/T install) Leave terminal and wire in place.
C103 ♂					
Note:	All C103 Terminals should remain undisturbed, along with the Distributor, EGRSV, EVAPSP, and both ECT pigtails.				
C100 ♂					
Note:	For M/T installations the C100 and PNP connectors & wire leads should be removed. For A/T installations they should remain in place.				

Part 5: 16v ENGINE HARNESS INSTALLATION

5.1. After removing any “extra” wires band the harness with electrical tape (every 3 or 4 inches) back into its original configuration.

5.2. Route the harness under the Intake manifold. On the front of the motor, connect the Injector Harness, EVAP SV & EGR PV valves, the ECT and Temp Gauge sensors. Then connect the distributor.

5.3. Once you are satisfied with the fit remove the harness and run complete continuity checks on each wire in each circuit. *Note: There are no closed circuits in this harness. Every wire is seated in an “open” connector on both ends.* Check each wire for continuity (end-to-end, by color, including grounds). Check for cross continuity between circuits (each wire to each differently colored wire). Any continuity here indicates a fault.

5.4. Correct any faults then fit the harness with corrugated wire loom and wrap the entire thing in good quality electrical tape. An additional wrapping of self-fusing silicon tape will make it relatively waterproof (but it's expensive).

5.5. There will be a fairly long pigtail left to connect at the firewall. Once everything is installed, secure any loose harness sections to prevent chafing. The bendable “clamps” from your old motor and/or donor work well for this as they can be screwed or bolted wherever they are needed.

Part 6: SAMURAI PREPARATION

- 6.1. Disconnect (and leave behind) all plugs necessary for engine removal.
- 6.2. Remove engine.
- 6.3. Remove glove box door, door catch, & liner (requires removal of the hood release cable).
- 6.4. Disconnect the ECM (see Fig 21-40, #14). Remove the computer & bracket together. Separate them and save the bracket (set the old computer aside – you might be able to sell it later).
- 6.5. Locate & disconnect the white 1-pin connector on the heavy WHT/YEL wire and the white 6-pin connector (with YEL/BLK, BLK/YEL & BLK/WHT wires), located between right side of glove box & inside of fender (see fig 21-40, #3). Locate & disconnect the 2 rectangular connectors (1 natural, 1 blue) under the dash, on the driver's side, above the fuse block (see fig 21-40, #2). This separates wire harness No. 1 from wire harness No. 2.

Instrument Panel Wiring

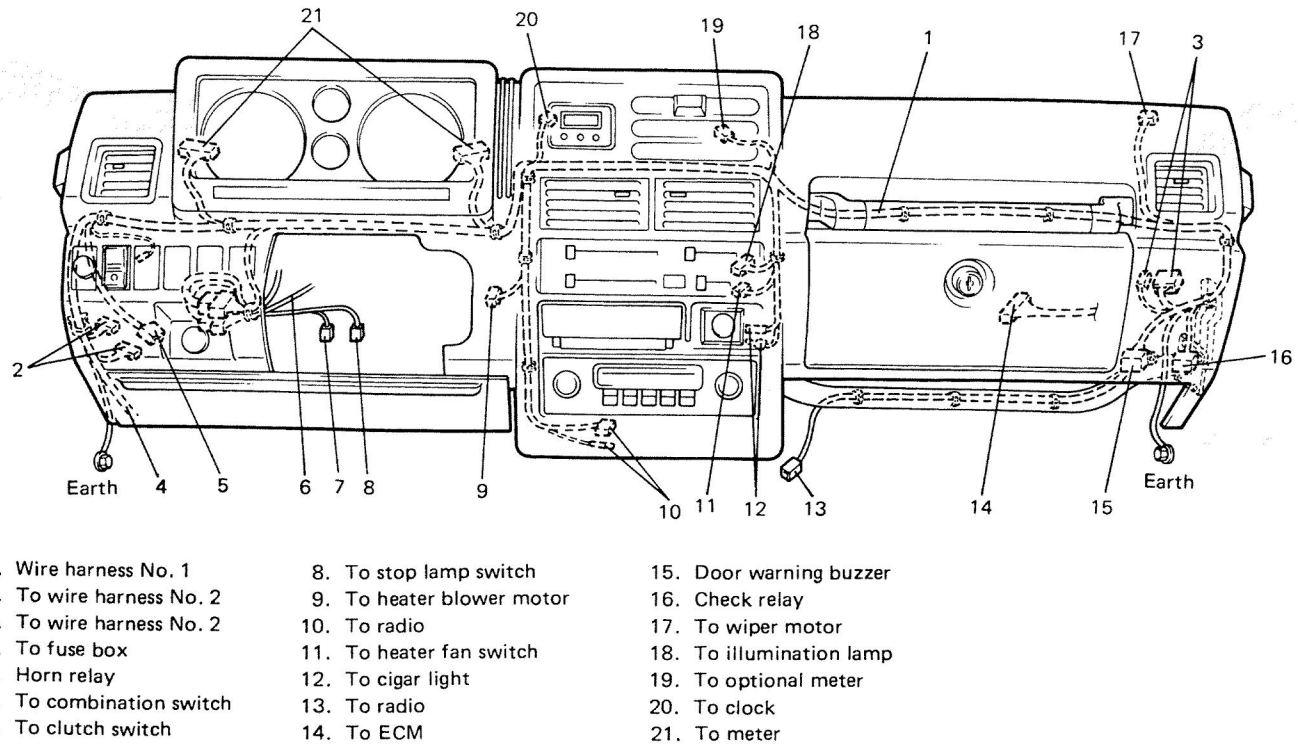


Fig. 21-40

Note: 1986 through 1988 Samurais with the "round vent dash" have an 8-pin connector instead of a 6-pin (Fig: 21-40 #3).

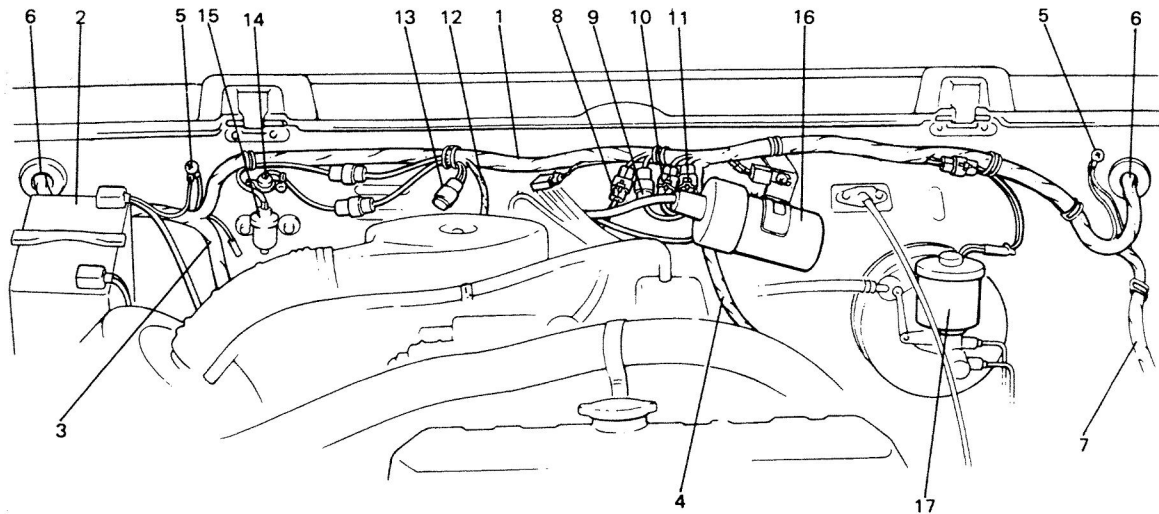
- 6.6. Remove the Combination Meter (instrument cluster)
- 6.7. Pry the firewall grommets out the engine bay side (see Figure 21-37, #6). Be careful not to damage them. Then gently pull the connectors on both ends of the firewall harness out of passenger compartment. Let the wire bundles, grommets, and connectors hang over their respective fenders outside the vehicle.
- 6.8. Unplug everything else on the firewall. Remove the Ignition Coil (Fig. 21-37 #16), Thermal Engine Room Switch (fig 21-37 #14), High Altitude Compensator (Fig. 21-37, #15) and Noise Suppressor (not shown). Also disconnect the Brake Fluid Level Switch (above the reservoir, Fig. 21-37, #17). This allows the firewall harness more freedom of movement.

6.9. Disconnect the three firewall grounds (see Fig. 21.37, #5). The 3rd is behind the Coil near the center of the firewall.

6.10. Loosen the firewall hanger loops by bending them down (gently). Pull the harness away from the firewall as much as possible. This gives you room to work. Note the wire harness branch that leads under the transmission tunnel (Fig. 21-37, #4). It prevents the firewall harness from being completely removed from the vehicle. With all the plugs disconnected and the clamps undone there should still be plenty of slack.

6.11. Expose the wires by removing the tape & plastic wire loom from the old harness. Then unwind the internal tape that bundles the wires together.

Engine Room Wiring



- | | |
|---|--------------------------------|
| 1. Wire harness No. 2 | 12. To TWSV |
| 2. Battery | 13. Duty check coupler |
| 3. To starter, alternator, head light, small light, horn and etc. | 14. Thermal engine room switch |
| 4. To license light, stop/tail light, 4WD switch | 15. HAC |
| 5. Earth | 16. Ignition coil |
| 6. To wiring harness No. 1 | 17. Brake fluid reservoir |
| 7. To head light, small light, etc. | |
| 8. To distributor | |
| 9. To ignition coil | |
| 10. To back up light switch | |
| 11. To fifth switch | |

Fig. 21-37

6.12. Working at the passenger side fender:

6.12.1. Create a single wire pigtail by cutting WHT/YEL wire (8" to 10" from the plug). Bag pigtail and set aside.

6.12.2. Create a 3-wire pigtail with the BLK/WHT, BLK/YEL & YEL/WHT wires and the 6-pin plug. Cut wires 8" to 12" from the plug staggering the cuts approximately 2" apart. Bag the pigtail.

6.12.3. Extract all the terminals from the old ECM connector. Deconstruct the rest of the harness per the following table.

WIRE-BY-WIRE DETAILS - Samurai Harness Deconstruction

Wire Color	Circuit	Connection	Notes
BLK/GRN	ECM Ground	C1-1	Cut off ECM terminal Leave wire in place.
BRN	Ignition Signal (RPM)	C1-2	Cut off fork at first splice leaving single wire that feeds back through driver's-side grommet.
BLU/RED	Mixture Control Valve	C1-3	Pull wires through grommet. Separate segments. Extract connector terminals and discard wires.
GRY/YEL	Wide Open Throttle Switch	C1-5	
BLU/BLK	Fuel Cut Solenoid	C1-13	
GRY/BLK	Idle Micro Switch	C1-15	
BLU/WHT	Vent Solenoid Valve	C1-18	
GRY/RED	Thermal Switch	C1-4	Pull wire through grommet. Separate segment. Cut BLK/GRN ground at first splice. Bag pigtail for later sale.
BLU	Thermal Engine Room Switch	C1-11	
PNK/BLK	High Altitude Compensator	C1-14	
	Not Used	C1-6	none
BRN/YEL	Lighting Diode	C1-7	Pull wire through grommet. Abandon wire in harness.
BLU/GRN	3-Way EGR Solenoid	C1-8	Pull wire through grommet. Separate segment. Cut BLK/WHT lead at first splice. Bag pigtail for later sale.
BRN/WHT	3-Way Idle Up Solenoid	C1-12	
BLU/YEL	Vacuum Switching Valve	C1-16	
BLU/WHT	Vent Solenoid Valve	C1-18	
GRY	Oxygen Sensor	C1-10	Cut drain wire at splice. Pull sensor wire through grommet. Separate wire. Bag pigtail for later sale.
BRN/BLK	CEL/MIL signal	C1-17	Pull wire through grommet. Separate wire and set aside for splicing into new harness.
LT GRN/RED	5th Gear Switch (5GS)	C1-19	Pull wire through grommet. Separate segment. Extract BLK wire ground terminal (reserve for future use). Discard pigtail.
BLK	5th Gear Switch Ground		
LT GRN	Check Terminal	C1-20	Pull wire through grommet. Separate and discard pigtail
BLK	ECM Ground	C1-21	Pull wire through grommet. Separate and discard segment
BLK/WHT	Ignition, Coil, Meter Power	C1-9	Pull terminal and cut end through grommet.
		Generator	Separate segment. Pull terminals as necessary. Cut all extraneous leads off at splices leaving a 1-wire segment leading from the driver's side to the alternator plug.
BRN/WHT	Coil Signal	Coil	Disconnect
		Distributor	Extract terminal
		NS	Separate and discard "Y" segment & Noise Suppressor.
GRN	Stop Lamp Power (B+)	SLS-1	(A/T install only) Extract sockets remove Stop Lamp Switch & connector. Cut off GRN/WHT wire terminal.
GRN/WHT	Stop Lamp Signal	SLS-2	
BLU/BLK	4WD Signal		(A/T install only) Locate and cut 4WD signal wire (extending from drivers side) where it turns down the center firewall.

Part 7: ECM / FIREWALL HARNESS INTEGRATION

7.1. POWER DISTRIBUTION UPGRADE:

7.1.1. Install the “new” fusible link block bracket on the Samurai right fender-well in the same relative position it was located in the donor. Plug the 2 pigtails (WHT/YEL & WHT/GRN, WHT) into the bottom and install the fuse block.

- a. If the original bracket is not available, use the old air box bracket, inside the right fender fwd of the battery, to attach one side of the “new” fuse block. Fabricate a simple bracket or use a long bolt & spacer to secure the other side to the top of the fender well. Leave about 1.5” of room underneath for the connectors.

7.1.2. There are two methods for wiring in the “new” Fusible Link Block, the one depicted in diagram 8.5. works for all Samurai model years. The arrangement shown in 8.6. offers better load distribution but only works on 1988.5 & up models. In either case it is necessary to mount an aftermarket fuse panel under the dash. The capacity is up to the builder but a minimum of one (1) additional fuse is required. The new fuse panel should be located on the passenger side near the ECM & Relays.

Option 1 (8.5.): Cut the terminal off the end of the 8ga WHT/GRN wire opposite the connector. Route the wire up the fender harness, along the firewall and through the passenger-side grommet. Leave wire hanging outside over the fender.

Option 2 (8.6.): Route the 8ga WHT/GRN wire (w/ terminal), up the fender harness, along the firewall, and through the driver's-side grommet. Route the 10ga WHT wire up the fender harness, along the firewall and through the passenger-side grommet. Leave both wires hanging outside over the fender(s).

7.1.3. Route the 8ga WHT/YEL wire up the fender harness, along the firewall, and through the passenger-side grommet, splice it to the WHT/YEL pigtail from the Samurai harness (**S2X**). *Note: the WHT/YEL lead from the new fusible link block is more than long enough you may want to cut a few feet off the end before splicing.*

7.2. The 16v distributor just clears the Samurai coil bracket. The “new” Coil and Igniter must be located elsewhere on the firewall. Identify a location for the bracket on the center firewall. Consider relative wire length and available hood & engine clearance. Installing the bracket upside down will maintain proper directionality of the wires and connections. Temporarily install the Coil & Igniter at or near their final location. To ensure proper clearance & wire reach, final installation should not be completed until the engine is in place.

7.3. Depending on the amount of slack in the new harness and/or the brand of O2 sensor, the sensor pigtail might or might not reach the harness connector at the firewall. The exhaust must be installed to know for sure. An “extension cord” can usually be fabricated from leftover wires (w/ terminals) and connector housings eliminating the need for splicing.

7.4. During assembly lay the IAT & MAF sensor pigtails up on the cowl (under the windshield) out of the way. These pigtails may or may not be long enough to reach their respective sensors. The induction system must be installed to determine if extension is required.

7.5. When pulling the new wires through the Samurai firewall grommets, the side that faces the engine bay is considered the “outside”. Unless noted otherwise, most of the wires are fed from the outside to the inside.

7.6. Again, working at the Samurai passenger side fender, build the new ECM and Relay pigtails according to the tables on the following pages. There should be 10” to 12” of wire between the ECM connectors and the firewall grommet. The relay pigtails need to be about 2” longer. The splices for the WHT/YEL, BLK/YEL, YEL/WHT and BLK/WHT wires should all be made on the “inside” of the grommet (so they wind up under the dash).

7.7. During A/T installations, as the under dash wiring and components are reassembled, their relationship to the new Samurai environment will become apparent. The Shift Diode and Shift Lock Relays can be secured in place under the dash wherever they end up. Taping them to a nearby wire bundle is perfectly acceptable.

7.8. Using the Integration Tables on the following pages, and the wiring schematics in Part 8, incorporate the “new” wiring into the Samurai harness.

WIRE-BY-WIRE DETAILS - 16v ECM Harness Integration

Wire Color	Circuit	Diagram	Connection	Notes
ECM C1				
WHT	Memory Power	8.2.	C1-1	Insert terminals as indicated. Splice a 4' piece of white 18ga wire to both the ECM & C206 leads forming a "Y" segment (S2G). Attach a 1/4" male spade terminal to the other end of the new extension wire.
WHT	DLC Power (B+)	8.2.	C206-9	
BLK	DLC Ground	8.2.	C206-5	Splice C206 pigtail ground to old ECM ground (S2H).
BLK/YEL	Crank Signal	8.2.	C1-2	Insert ECM wire terminal as indicated.
		8.2.	C205-8	With A/C - Insert terminal as indicated.
			Cut Lead	(M/T Install) Splice to BLK/YEL wire from 6-pin plug (S2B).
			Starter Solenoid	(M/T Install) Feed the spade terminal through firewall grommet (inside to outside). Route wire along passenger-side fender-well harness (Fig 20-37 #3). Turn inward about halfway along the fender. Providing an 8" to 10" pigtail to connect to the Starter Solenoid.
		8.4.	C204-3	(A/T Install) Feed ECM terminal through the firewall grommet. Pull about 12" of wire through the grommet and Insert terminal as indicated.
BLK	Duty Check Ground	8.2.	DLC-4	Install Duty Check Connector on Fusible Link Bracket tab. Route BLK wire along WHT/GRN toward the center firewall. Reroute the 5GS ground wire along WHT/GRN wire from the opposite direction. Splice BLK wires together where they meet (S1B).
PPL	Duty Check Output	8.2.	C1-3	Feed ECM terminal through the firewall grommet. Pull about 12" of wire through the grommet and Insert terminal as indicated.
			DCC-6	Route other end along firewall, down fender well harness (Fig 20-37 #3) and back up fender (in front of the battery) to the DCC plug. Insert terminal as indicated.
ORG	Igniter Driver Output	8.2.	IG-3	Temporarily Connect pigtail to Igniter. (do not install lock clip)
			C1-4	Route the other end along the firewall harness (toward the passenger side). Feed ECM terminal through the firewall grommet and Insert as indicated.
PNK	Fuel Pump Relay Control	8.2.	C1-5	Insert terminal as indicated.
			FPR-3	Insert terminal as indicated.
BLU/RED	Test Switch Signal	8.2.	C1-6	Feed terminal through firewall grommet. Insert as indicated.
			DCC-5	Install DCC on Fuse Link bracket (see Fig. 8A-201-2). Route wire end along firewall, down fender well harness (Fig 20-37 #3) and back up fender (in front of the battery) to the DCC. Insert terminal as indicated.
YEL	VSS Signal	8.2.	C1-7	Insert ECM wire terminal as indicated. Splice on a 4' piece of white 18ga YEL wire (S2C). Attach a male bullet terminal to the other end (C01).
BRN	Ignition Signal (Tachometer)	8.2.	Cut End	Splice to BRN wire coming from the driver's side (S1C).
			NS-3	Insert terminal as indicated. Leave pigtail hang where it is.
			C1-8	Route wire along firewall. Feed ECM terminal through firewall grommet. Insert as indicated.
YEL/BLK	A/C Idle Up Signal	8.2.	C1-9	(A/C only) Insert socket as indicated.
			C205-9	(A/C only) Route wire as needed, insert pin as indicated.
BLU	Main Relay Control	8.2.	C1-10	Insert terminal as indicated.
			MR-3	Insert terminal as indicated.












WIRE-BY-WIRE DETAILS - 16v ECM Harness Integration

Wire Color	Circuit	Diagram	Connection	Notes
	Not Used		C1-11	none
BLU/BLK	Ignition Power	8.2.	C1-12	Insert ECM terminals as indicated.
BLU/BLK	Ignition Power	8.2.	C1-13	
		8.2.	MR-4	Insert Relay terminals indicated.
			FPR-2	
		8.3.	C204-17	Feed terminals through firewall grommet. Route wires along firewall. Insert terminal as indicated.
			MAF-1	
		8.4.	TCCR-1	(A/T Install) Re-install TCC Relay on Fusible Link bracket (see Fig. 8A-201-2). Feed terminal through firewall grommet (inside to outside) Route wire along firewall, down fender harness (Fig 20-37 #3) back up fender (in front of battery) to relay. Insert terminal as indicated. Temp. install plug.
PPL/YEL	CEL/MIL Control	8.2.	Cut Lead	Splice to BRN/BLK wire coming from the driver's side (S1A).
			C1-14	Feed ECM terminal through firewall grommet. Insert as indicated.
			DLC-3	Route wire along firewall, down fender well harness (Fig 20-37 #3) and back up fender (in front of the battery) to DCC plug. Insert terminal as indicated.
LT GRN/WHT	EGR SV Control	8.3.	C1-15	Feed terminal through firewall grommet. Insert as indicated.
			C204-5	Route wire along firewall harness (toward the driver's side) as far as it will go. Insert the terminal as indicated. Leave 4" lead off main firewall harness.
WHT/YEL	TCCR Control (A/T only)	8.4.	C1-16	Feed terminal through firewall grommet. Insert as indicated.
			TCCR-3	Route wire along firewall, down fender well harness (Fig 20-37 #3) and back up fender (in front of the battery) to relay. Remove plug. Insert terminal as indicated. Temporarily re-install connector.
BLU/YEL	Diagnostic Request Signal	8.2.	C1-17	Feed terminal through firewall grommet. Insert as indicated
			DCC-2	Route wire along firewall, down fender well harness (Fig 20-37 #3) and back up fender (in front of the battery) to DCC plug. Insert terminal as indicated.
BLU/WHT	Idle Switch Signal	8.3.	C1-18	Feed terminal through firewall grommet. Insert as indicated.
			C204-18	Route wire along firewall. Insert terminal as indicated.
BLU/ORG	Power Steering Press Signal	8.3.	C1-19	Feed terminal through firewall grommet. Insert as indicated.
			Bullet Connector	Route wire along the firewall (toward the driver's side) as far as it will go. Leave 1" lead off main firewall harness.
	Not Used		C1-20	none
			C1-21	
BLK/RED	PNP Signal (A/T only)	8.4.	C1-22	Insert socket.
			C204-8	Feed terminal through passenger-side firewall grommet (inside to outside). Route to connector. Insert as indicated.
			Cut End	Hang over passenger-side fender.
ECM C2				
BLK/BLU	ECM Ground	8.2.	C2-1	Feed terminal through firewall grommet. Insert as indicated.
			IG-2	Route wire to Igniter. Disconnect plug. Insert terminal as indicated. Reconnect plug.
			Cut End	Route wire along firewall to a point about 2" inboard of the HAC bracket. Let the extra wire hang down from there.

WIRE-BY-WIRE DETAILS - 16v ECM Harness Integration

Wire Color	Circuit	Diagram	Connection	Notes
BLK	ECM Ground	8.2.	C2-2	Feed ECM, HO2S, and CMP terminals and wires through the firewall grommet. Be careful with the drain wire splices. Insert ground wire terminals as indicated.
		8.3.	C209-7	Route wire along the firewall harness (toward the driver's side) as far as it will go. Insert terminal as indicated. Leave 6" lead off main firewall harness.
			MAF-3	Route to MAF connector (may have separate ground*).
			Cut Lead	Route wire along firewall harness. Group with C2-1 ground wire (above).
WHT	CMP Sensor Signal	8.2.	C2-3	Insert terminal as indicated.
			C209-5	Route wire along firewall. Insert terminal as indicated.
BLK	Drain Wire	8.2.	C209-4	Insert terminal as indicated.
YEL/BLU	Exhaust O2 Concentration	8.3.	C2-20	Insert terminal as indicated.
RED/BLU			HO2S-2	Route wire along firewall harness (toward the driver's side) as far as it will go. Leave 2" lead off main firewall harness.
WHT				
	Not Used		C2-4	none
			C2-5	
GRY/RED	Throttle Position Signal	8.3.	C2-6	Feed terminal through firewall grommet. Insert as indicated.
			C204-14	Route wire along firewall. Insert terminal as indicated.
GRY	Reference Voltage (5V)	8.3.	C2-7	Feed terminal through firewall grommet. Insert as indicated.
			C204-13	Route wire along firewall. Insert terminal as indicated.
GRY/BLK	MAF Signal	8.3.	C2-8	Feed terminal through firewall grommet. Insert as indicated.
			MAF-2	Route connector wire along firewall (toward the driver's side). Set pigtail aside on cowl.
BLK/BLU	MAF (independent ground*)		MAF-3	Insert terminal as indicated. Route wire along firewall. Group with ECM grounds.
RED/YEL	ECT Signal	8.3.	C2-9	Feed terminal through firewall grommet. Insert as indicated.
			C204-15	Route wire along firewall. Insert terminal as indicated.
	Not Used		C2-10	none
RED	Fuel Injector #1 Control	8.3.	C2-11	Feed terminal through firewall grommet. Insert as indicated.
			C204-21	Route wire along firewall. Insert terminal as indicated.
LT GRN/BLK	IAC Valve Control	8.3.	C2-12	Feed terminal through firewall grommet. Insert as indicated.
			C204-12	Route wire along firewall. Insert terminal as indicated.
WHT/GRN	Fuel Injector #3 Control	8.3.	C2-13	Feed terminal through firewall grommet. Insert as indicated.
			C209-2	Route wire along firewall. Insert terminal as indicated.
BLK/GRN	ECM Ground	8.3.	C2-14	Insert ECM terminal as indicated.
			Cut End	Feed end through firewall grommet (inside to outside). Route wire along firewall. Group with other ECM grounds.
GRY/YEL	Sensor Ground	8.3.	C2-15	Feed terminal through firewall grommet. Insert as indicated.
	DO NOT GROUND SENSORS TO ENGINE OR CHASSIS!		C204-19	Route wire along firewall. Insert terminal as indicated.
			HO2S-1	Route wire along firewall. Insert terminal as indicated.
			IAT-2	Connect to IAT pigtail as indicated.
PPL/GRN	Serial Data Output	8.2.	C2-16	Insert ECM terminal as indicated.
			C206-6	Insert other end into C206 pigtail as indicated.

WIRE-BY-WIRE DETAILS - 16v ECM Harness Integration

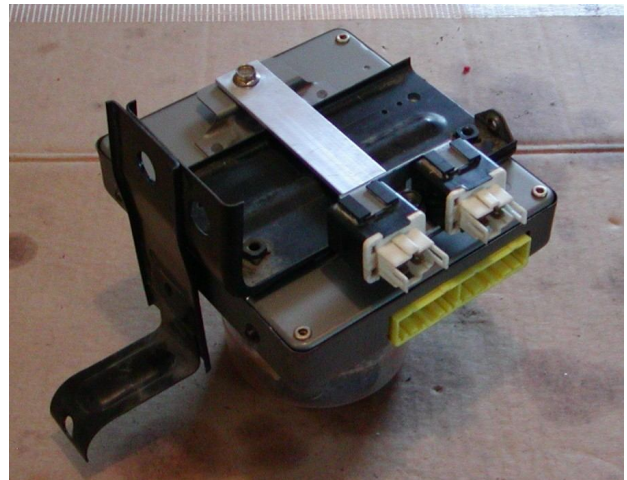
Wire Color	Circuit	Diagram	Connection	Notes
RED/GRN 	EGR Temperature Input	8.3.	C2-17	Feed terminal through firewall grommet. Insert as indicated.
			C209-1	Route wire along firewall. Insert terminal as indicated.
	Not Used		C2-18	none
			C2-19	
RED/BLK 	Inlet Air Temperature Signal	8.3.	C2-21	Feed terminal through firewall grommet. Insert as indicated.
			IAT-1	Route connector wire along firewall harness (toward driver's side). Set pigtail aside on cowl.
	Not Used		C2-22	none
PNK 	HO2S Heater Control	8.3.	C2-23	Feed terminal through firewall grommet. Insert as indicated.
			HO2S-3	Route wire along firewall. Insert terminal as indicated.
LT GRN/RED 	Fuel Injector #2 Control	8.3.	C2-24	Feed terminal through firewall grommet. Insert as indicated.
			C204-22	Route wire along firewall. Insert terminal as indicated.
LT GRN/YEL 	EVAP SP Valve Control	8.3.	C2-25	Feed terminal through firewall grommet. Insert as indicated.
			C204-10	Route wire along firewall. Insert terminal as indicated.
WHT/BLK 	Fuel Injector #4 Control	8.3.	C2-26	Feed terminal through firewall grommet. Insert as indicated.
			C209-3	Route wire along firewall. Insert terminal as indicated.
C204 ♂ (remaining wires & cavities)				
ORG/BLK 	4WD Switch (A/T only)	8.4.	C204-1	Insert pin route wire to firewall.
			Cut End	Splice to BLU/BLK from Samurai 4WD Indicator (S1H).
	Not Used		C204-2	none
			C204-4	
			C204-6	
			C204-7	
YEL/WHT 	Engine Temp Gauge Signal	8.4.	C204-9	Insert pin, route wire along firewall.
			Cut End	Feed wire through firewall grommet. Splice to YEL/WHT from 6-pin Plug (S2A).
BLK/GRN 	Ground (A/T only)	8.4.	C204-11	Insert pin route wire to firewall.
			Cut End	Splice to BLK (ground) from Samurai 4WD indicator (S1G).
YEL 	PNP Switch (A/T only)	8.4.	C204-12	Insert pin route wire to firewall.
			Cut End	Splice to YEL from Stop Lamp pigtail (S1E).
BRN/RED 	PNP Switch (A/T only)	8.4.	C204-16	Insert pin route wire to firewall.
			Cut End	Splice to RED from Stop Lamp pigtail (S1F).
C206 ♂ (remaining cavities)				
	Not Used		C206-1	none
			C206-2	
			C206-3	
			C206-4	
			C206-7	
			C206-8	
			C206-10	

WIRE-BY-WIRE DETAILS - 16v ECM Harness Integration

Wire Color	Circuit	Diagram	Connection	Notes
C209 ♂ (remaining cavities)				
BLU/RED	PNP Signal (A/T Only)	8.4.	C209-6	Feed C209 terminal through drivers-side firewall grommet. (inside to outside) Insert as indicated.
			SLR-3	
			C201-4	
WHT	TCC Relay (A/T Only)	8.4.	C209-8	Insert C209 terminal. Route wire along firewall, down fender well harness (Fig 20-37 #3) back up fender to TCCR plug (see Fig. 8A-201-2). Insert terminal as indicated.
			TCCR-4	
Misc. (remaining wires)				
BLK/WHT	Igniter, Coil, Meter Power (B+)	8.2.	Cut End	Feed wire end and relay terminals (plus SLS-2 terminal for A/T Install) through the firewall grommet (outside to inside). Insert relay terminals as indicated. Splice cut end to BLK/WHT from Samurai 6-pin connector pigtail (S2D). Route wires along firewall harness. Insert terminals as indicated.
			FPR-1	
			MR-1	
			NS-2	
			Coil-1	
			HO2S-4	
BRN/WHT	Coil Signal	8.2.	Coil 2	Insert as indicated (creates a pigtail for the Coil).
			NS-4	Insert terminal as indicated. Group wire with NS pigtail.
			IG-1	Disconnect Igniter plug. Insert terminal as indicated. Reconnect plug.
BLK	Noise Suppressor Ground	8.2.	NS-1	Insert terminal as indicated. Group wire with NS pigtail.
			G108	Route wire along firewall harness. Ground as indicated.
			G109	Connect to ground tab on distributor after engine installation.
PNK/ BLK	Fuel Pump Power	8.2.	FP-4	Insert terminal as indicated. Feed cut end through firewall grommet (inside to outside). Splice on a 10' to 12' piece of 14ga RED wire (S1D). Route wire along firewall harness, down branch leading towards transmission (Fig 21-37, #4), and along underside of transmission tunnel. Secure wire to rear lighting harness every 4" to 6". Cut to fit and terminate as required for fuel pump installation.

7.9. ECM INSTALLATION: With some minor fabrication the donor ECM can be installed on the Samurai ECM bracket.

- Fabricate a retainer for the ECM from 1"x1/8" metal stock. Modify a relay bracket as necessary to hold the Main & Fuel Pump relays.
- Remove the LH angle bracket from the top of the ECM. Carefully drill out the spot welds with a 1/4" bit (just enough to free the bracket). **CAUTION: DO NOT DRILL THROUGH THE CASE!**
- Use the nut-plates on the top of the ECM to bolt the assembly together. Insert two short bolts or screws (not shown) in the top of the welded nuts on the Samurai bracket. Thread them all the way through and snug them down to take up any slack between the ECM and bracket. Be careful not to over-tighten them and dent the ECM case.
- Reinstall the assembly in the Samurai OEM location.



At this point:

You should have seven (7) connectors (all with female terminals) and three (3) wires (18ga WHT & YEL, & a 10ga WHT or an 8ga WHT/GRN) hanging over the passenger side fender to the right of (or “inside”) the grommet. A/T installs will have an additional BLK/RED wire.

1. ECM C1 (22-pin, yellow)
2. ECM C2 (26-pin, yellow)
3. Main Relay (4-pin, color varies)
4. Fuel Pump Relay (4-pin, color varies)
5. Harness Connector (6-pin w/ 3 wires, OR 8-pin w/ 8 wires, white or “natural”)
6. Battery Harness Connector (1-pin, white or “natural”)
7. C206 (8-pin w/ 3 wires, white or “natural”)

On the driver's side there should be two (2) connectors (one white, one blue) and possibly, an 8ga WHT/GRN wire. A/T installs will have an additional BLU/RED “Y” segment plus a WHT/RED wire. Both with female spade terminals.

Near the center firewall there should be a group of either three (3) or four (4) ground wires hanging together.

7.10. Feed the connectors (& wires) on both sides into the passenger compartment. Reinstall the grommets and mate the 8ga WHT/YEL and 6-pin connectors their opposites (by the glove box – Fig. 21-40 #3). Connect the white & blue connectors to their mates on the driver's side above the fuse block. Then make the independent wire connections outlined below.

7.11. Depending on which power distribution option is chosen. Either the 8ga GRN/WHT or the 10ga WHT wire (from the new fusible link block) becomes the primary power source for operating the engine.

Option 1 (8.5.): Install appropriate terminal on the 8ga GRN/WHT wire and connect it to the Aux. Fuse Panel input.

Option 2 (8.6.): Disconnect the Samurai ignition switch. Pull the “old” WHT/YEL wire terminal out of the harness connector and replace it with the “new” 8ga WHT/GRN wire terminal. Connect the 10ga WHT to the Auxiliary Fuse Panel input.

SAFETY NOTE: In Method 2 the old WHT/YEL wire will be hot whenever the battery is connected! Insulate the exposed terminal, or insert it in an unused plug housing, and tie it up out of the way. *Note: this connection makes a good un-fused power source for future projects.*

7.12. Insert the BLK/RED terminal in the Main Relay connector. Route the wire the new auxiliary fuse panel. Install the appropriate terminal and connect it to one of the outputs. Mark this location “FUEL INJ” and insert a 15 amp fuse.

7.13. Plug in the ECM, Main & Fuel Pump relays.

7.14. Use the existing wire hangars to route the new 18ga WHT & YEL wires from the ECM along the back side of the dash brace toward the drivers-side.

7.14.1. Feed the WHT wire up to the clock connector (Fig 20-40, #20) and insert the spade terminal into cavity 3 (opposite existing WHT wire). *Note: if vehicle has a clock use a tap splice instead of the spade terminal.*

7.14.2. Route the YEL wire to a point bellow the steering column. Let the bullet terminal hang there for the time being.

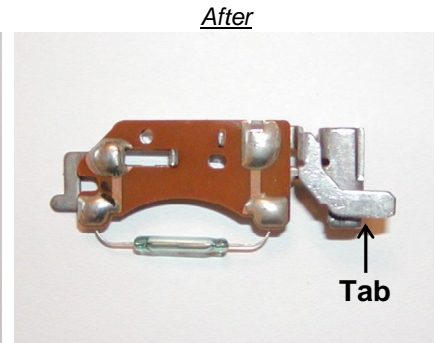
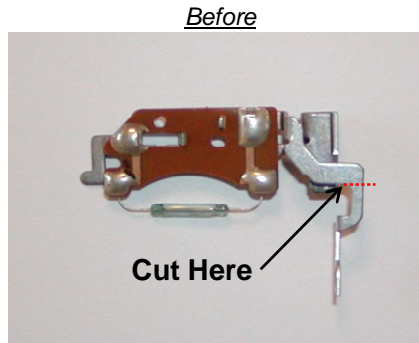
7.15. Next, install the Data Link Connector in an accessible spot under the passenger side dash and connect the pigtail to the ECM harness (C206).

7.16. VSS INSTALATION: The VSS mounts essentially the same way in the Samurai speedometer as it does in the donor. However, it must be provided with independent signal & ground wires. As with other aspects of this process, there are several ways to do this. One of them is detailed below:

7.16.1. Cut two 2' pieces of 18ga wire (1 YEL, 1 BLK). Attach a 1/8" female spade terminal to one end of the YEL wire and a female bullet terminal (C01) to the other. Attach a 1/8" female ring terminal to the end of the BLK wire and a male bullet terminal (C02) to the other end.

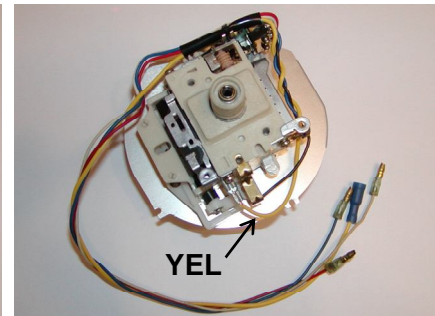
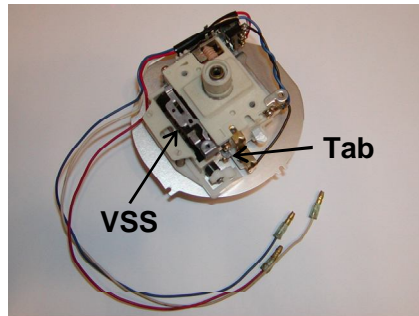
7.16.2. Take the Samurai Speedometer out of the Combination Meter.

- a. Cut longer "leg" off VSS bracket to form a tab. Shape the tab so that the YEL female spade terminal fits on it.

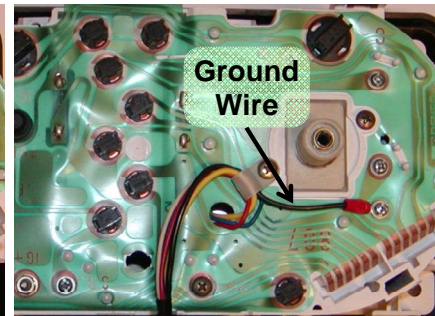
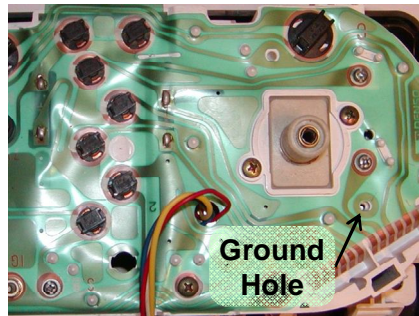


- b. Install the VSS and connect the YEL (signal) wire. Group the new YEL wire with the RED, WHT & BLU Mileage Switch wires.

Feed them through the back of the instrument cluster housing and reinstall the speedometer.



- c. Locate the VSS ground hole on the back of the cluster housing (behind the speedometer). Using a screw from the donor instrument cluster attach the BLK (ground) wire here. Group it with the YEL, RED, WHT & BLU wires to form a 5-wire, multi-end pigtail.



Note: In order for plastic frame units to fit properly the small "cage" surrounding the reed switch must be carefully trimmed away. Also the YEL wire is attached by a ring terminal with the mount screw (to the side with only one tab). The remainder of the installation is the same.

7.16.3. While you have the Combo Meter out, **check all the indicator and illumination bulbs!** Replace any burned out bulbs with good ones from the donor cluster. As trivial as this sounds, eliminating the possibility of faulty bulbs **prior** to troubleshooting and/or tune up, will save time & aggravation.

7.16.4. Reinstall the instrument cluster. Feed the 5-wire bundle down and to the right of the steering column. Connect the RED, WHT, BLU & YEL bullet terminals (C01) to their opposites.

7.16.5. Construct an 8" segment of 18ga BLK wire with a Female bullet terminal to one end and a 1/4" ring terminal on the other. Secure the ring terminal to the existing ground point on the dash frame below and to the left of the steering column. Connect the BLK wire bullet terminals (C02).

7.17. A/T INSTALLATION (Only):











7.17.1. Route WHT/RED wire from TCC Relay (now under diver's-side dash) to the Stop Lamp Switch (above the brake pedal). Insert socket at position #2.

7.17.2. Route BLK/RED (from ECM & PNP switch) under dash to diver's side. Cut the Samurai BLK/RED wire 3" from the Clutch Position Switch connector and splice the two ends together (**S2J**).

7.17.3. Route BLU/RED "Y" segment leads (from C209) to the SLR and C201 plugs, insert terminals as indicated.
Note: C201 is only used for two wires (BLU/RED & BLU/GRN). There isn't really a need for a disconnect at this point. The plug can be eliminated by cutting off the terminals and splicing the wires together.

7.17.4. Once the terminals for the Shift Diode and Shift Lock Relay have all been reinserted in their respective connectors, plug in the components and secure them up under the dash.

WIRE-BY-WIRE DETAILS - 16v Harness Integration for 3 A/T

Wire Color		Circuit	Diagram	Connection	Notes
C201 ♀					
BLU/GRN		Shift Interlock	8.4.	SLR-4	Insert socket in connector. Hang plug loosely from dash support bracket just to the right of the steering column.
				C201-10	Route C201 end of pigtail toward center console and allow it to hang just to the left of the radio.
C201 ♂					
BLU/RED		Shift Interlock	8.4.	C201-4	Insert pins, route C207 pigtail to Manual Selector Lever (or, if not yet installed, that general location).
BLU/GRN		Shift Interlock	8.4.	C201-10	
C207 ♀					
RED/YEL		Lighting switch	8.4.	C207-1	Route wire back up under dash (behind center console)
				Cut End	Locate the Illumination lamp plug for the HVAC panel (Fig. 21-40 #18). Tap splice the donor wire into the RED/YEL wire on the main harness side of the plug (S2K).
RED/GRN		Illumination controller (dimmer)	8.4.	C207-2	Route wire back up under dash (behind center console)
				Cut End	Locate the Illumination lamp plug for the HVAC panel (Fig. 21-40 #18). Tap splice the donor wire into the RED/GRN wire on the main harness side of the plug (S2L).
SLS (Stop Lamp Switch)					
WHT/RED		TCC Relay signal (A/T Only)	8.4.	SLS-4	Feed terminal through drivers-side firewall grommet.
				TCCR-2	Route other end along firewall, down fender well harness (Fig 20-37 #3) and back up fender (in front of the battery) to TCCR plug. Insert terminal as indicated
GRN		Stop Lamp B+	8.4.	SLS-1	Install Donor SLS. Insert Samurai terminal as indicated.
GRN/WHT		Stop Lamp Signal	8.4.	SLS-3	Insert donor terminal as indicated.
				SLR-1	Insert donor terminal as indicated.
				Cut End	Splice to cut end of Samurai GRN/WHT that used to feed the “old” SLS (S2N).
SD (Shift Diode)					
YEL/BLU		Shift Lock Relay B+ (A/T Only)	8.4.	Cut End	Tap splice wire into Wiper Washer feed at or near the fuse block (S2M).
BLU/BLK		Shift Lock Relay B+ (A/T Only)	8.4.	SLR-2	Route wire as necessary to reach the Shift Lock relay plug. Insert terminal as indicated.

7.18. Moving back to the engine compartment, zip-tie or band (with tape) the new combined firewall/ECM harness together into each respective branch. **DO NOT WRAP IT** fully until after you get the motor running (just in case).

7.19. Install the center firewall ground (now designated G108). Reinstall the two remaining original firewall grounds (see Fig 21-37 #5) and secure the harness in place with the mounting tabs.

7.20. After engine installation, secure the ignition components to the firewall, connect the IAT, and MAF sensors (extend wiring if required) and account for any “loose” wires (check the in-place wiring against the diagrams). To prevent shorts cover the exposed ends of any wires that have been abandoned in place (i.e. elect. tape, shrink wrap, wire nut, etc.).
Note: doubling a dead end wire back on itself before applying tape or heat shrink will reduce the likelihood of the insulation sliding off the end.

7.21. Locate the ground point on the back corner of the intake manifold (now designated G110). Cut ECM ground wires to fit. Attach two ¼” ring terminals (two pairs of 2 if there are 4, one pair and one single if there are 3).

7.22. Attach the ground wire connector (from G108) to the tab on the back of the distributor (G109).

7.23. Tie up and secure the pigtail from the transmission for the 5th Switch. It is not needed, but must be left installed to keep the hole plugged. *Note: the 5th Gear, Backup Light, & 4WD Light switches are all interchangeable. The unused 5th Switch makes a good spare for the other two.*

7.24. BEFORE INSTALLING THE BATTERY and after all components are fixed in their final locations. Disconnect all the new plugs and grounds and run complete continuity checks on each wire in each circuit.

7.24.1. **Check for continuity within each circuit** (each wire, end-to-end, by color, including grounds)

7.24.2. **Check for cross continuity between circuits** (each wire to each differently colored wire). Any continuity here indicates a fault.

7.24.3. **Connect & Check grounds** (attach grounding terminals and check wires at relevant connectors for continuity to ground).

7.24.4. **Check each circuit for short to ground** (check each continuity to ground).

Make corrections ONE AT A TIME, then re-test.

Multiple changes during troubleshooting can make it nearly impossible to isolate a problem.

7.25. During final reassembly, apply a light coat of dielectric silicone grease to the terminals in each connector before plugging them back in. This will help ensure good electrical continuity and inhibit corrosion.

7.26. After all faults have been eliminated, install the battery and run operational tests on each sensor (per donor FSM).

7.27. Once the engine is started perform tune-up procedures (timing & idle adjustments – per donor FSM specs.)

7.28. Check the Onboard Diagnostic System for proper operation. Disconnect the battery to reset the computer. Reconnect the battery and road test the vehicle.

7.29. After the road test, call up any Diagnostic Trouble Codes (DTC) that may be stored in the computer. DTC 12 (one flash of the CEL followed by two more, repeated in cycles of three) indicates all clear. Record any other codes then follow donor FSM troubleshooting procedures to correct the problem. Repeat the process until all DTC's have been cleared.

Part 8: WIRING DIAGRAMS

8.1. SYMBOLS:

COMPONENTS



Lamp



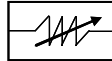
Fuse (15 Amp)



Diode



Solenoid



Temperature Sensor



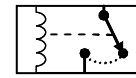
Heated O2 Sensor



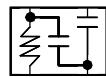
Reed Switch



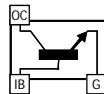
Switch



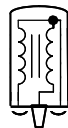
Relay



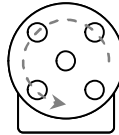
Noise Suppressor



Igniter



Ignition Coil



Distributor
(Rotation Indicated)



Spark Plug

WIRING

Donor OEM Splice } S295

Project Splice } S22

Donor OEM Connector & Terminals } C204
21
22

Samurai Plug W/ Project Terminal } CLOCK PLUG

Project "Connector" })

G16B Ground } G110

Project Ground } G02

Samurai Ground }

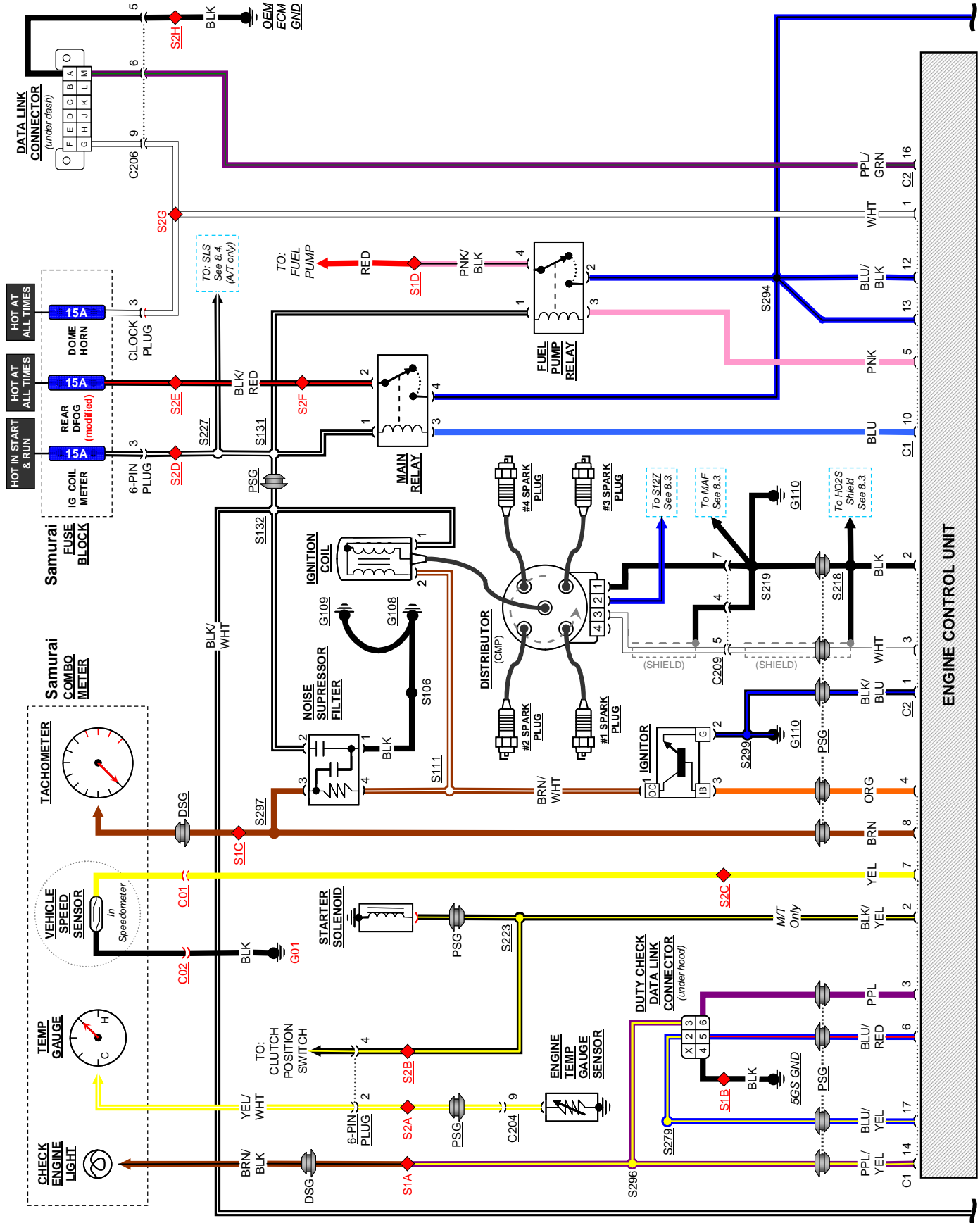
Off Diagram Link } TO: CLUTCH POSITION SWITCH

On Diagram Link } To MAF See 8.3

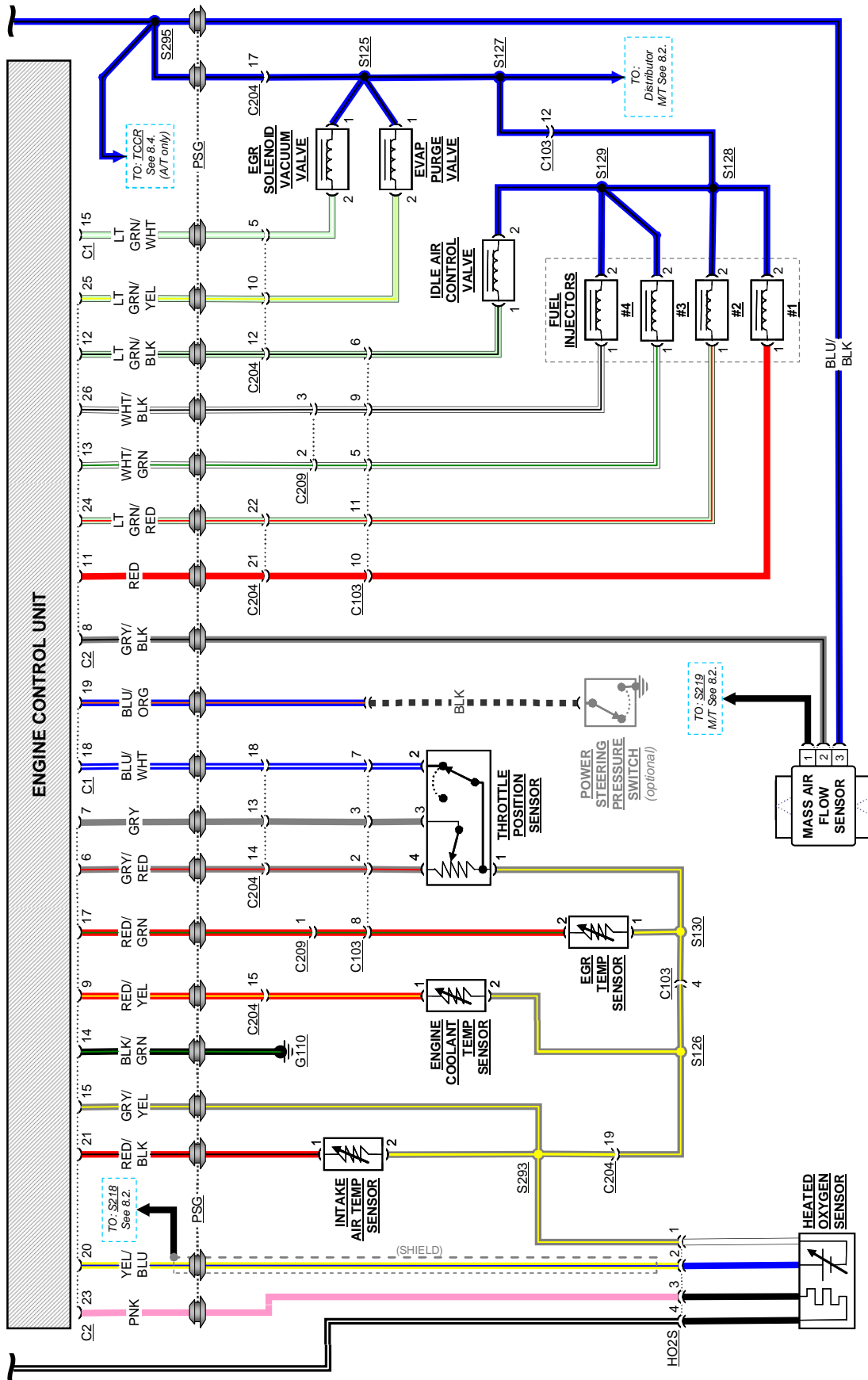
Samurai Firewall Grommet } PSG

PSG = Passenger-Side Grommet
DSG = Driver-Side Grommet

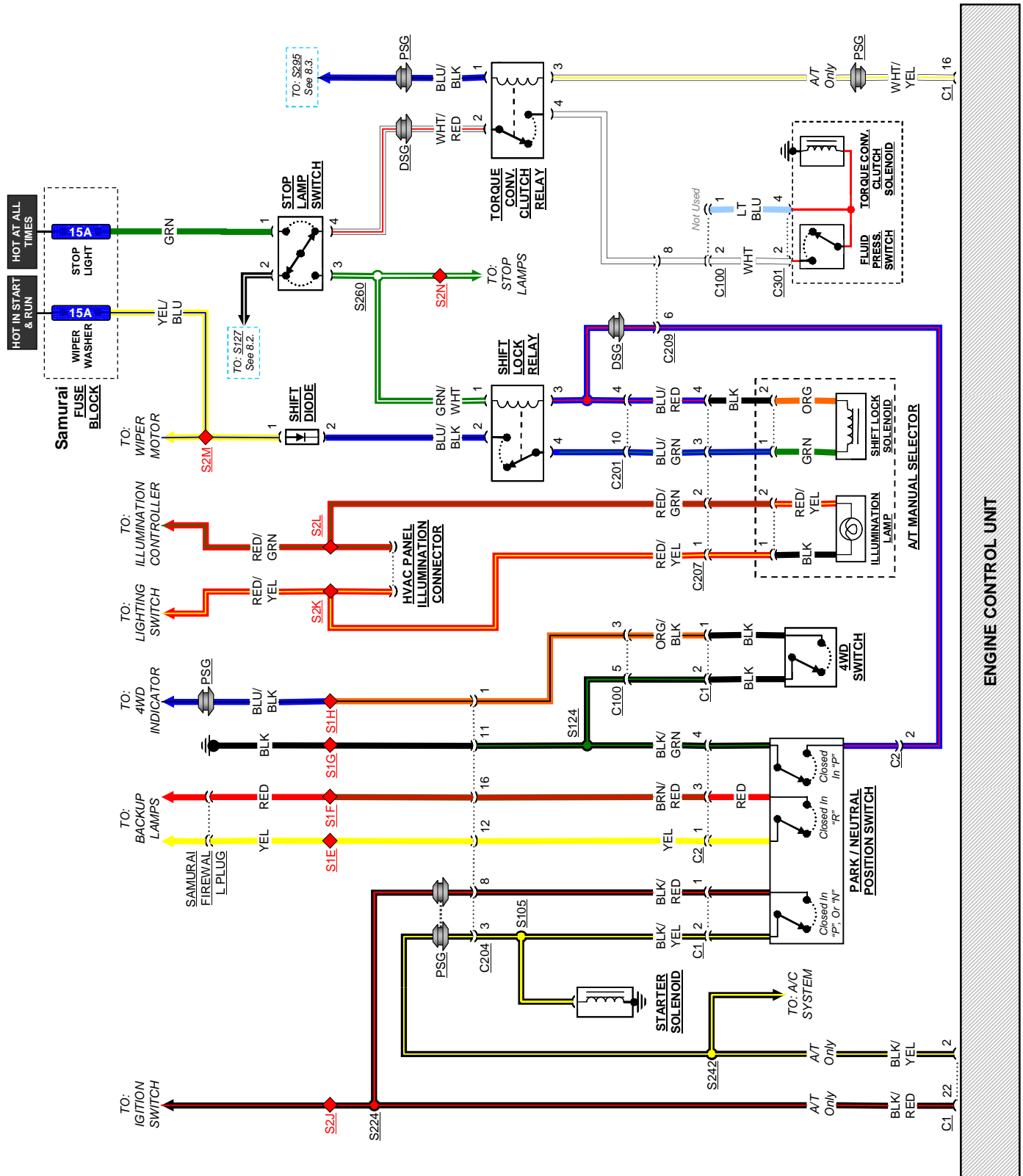
8.2. ECM / ENGINE WIRING: Manual Transmission



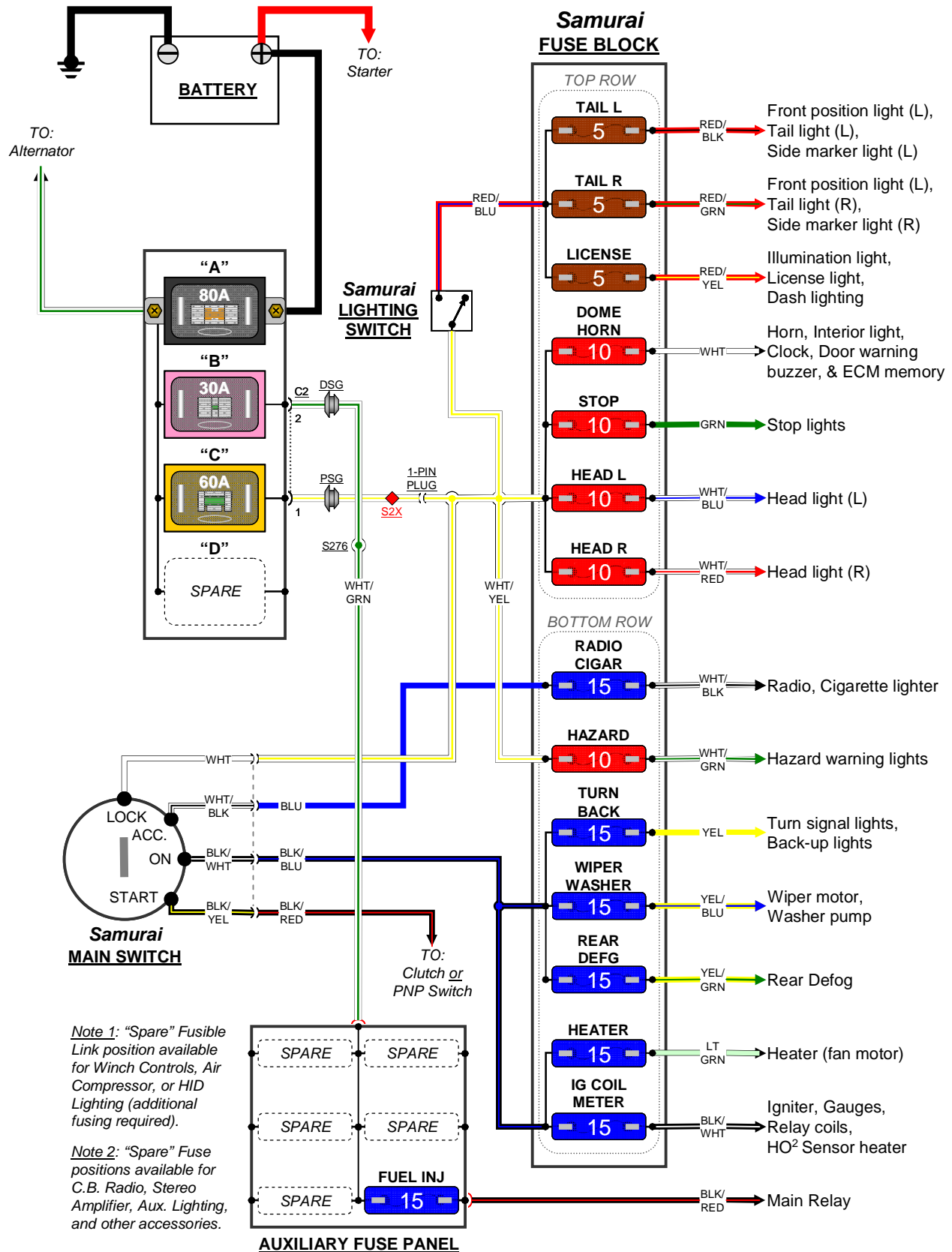
8.3. ECM / ENGINE WIRING: Sensors



8.4. ECM / ENGINE WIRING: 3-Speed Automatic Transmission



8.5. MODIFIED SAMURAI POWER DISTRIBUTION (Option 1):



8.6. MODIFIED SAMURAI POWER DISTRIBUTION (Option 2):

